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CONTENTS

The Excess Demand for Labour. A Study of Conditions in Great Britain, 1946–56. By J. C. R. DOW and L. A. DICKS-MIREAUX . 1

The Eisenhower Administration and the Recession 1953–5. By A. E. HOLMANS 34

Intertemporal Relation of Demand and the Preference System of the Firm. By SYED AHMAD 55

The Development of the Tied House System in London. By D. M. KNOX 66

Insurance Companies and the Finance of Industry. By G. CLAYTON and W. T. OSBORN 84

The Methodology of the Theory of Return to Scale. By DAVID SCHWARTZMAN 98

Valuation, Demand, and the 'Anti-Giffen' Case. By MURRAY C. KEMP 106

In Defence of Public-Utility Price Theory. By M. J. FARRELL . 109

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THE EXCESS DEMAND FOR LABOUR

A STUDY OF CONDITIONS IN GREAT BRITAIN, 1946–56[1]

By J. C. R. DOW *and* L. A. DICKS-MIREAUX

1. Introduction

THE statistics of unemployment and of unfilled vacancies are frequently used to illustrate trends in the demand for labour; and this study is basically an examination of their reliability in this use. Contrary to what might be supposed, they appear to be rather good indicators. Indices of the pressure of labour demand based on these data have been compiled for Great Britain as a whole (Fig. 4) and separately for seven broad industry groups (Figs. 5–11). These indices are probably fairly reliable as *ordinal* indicators, i.e. in giving an account of the successive phases of high and low demand in different industries since the war. The most striking feature of the results, however, is that the indices appear to show that the excess demand for labour was in aggregate never very considerable. The indices are not highly reliable when so used as *cardinal* measures of the extent of excess demand, but it is difficult to dismiss their evidence entirely. It seems necessary to consider, therefore, whether these results can be reconciled with commonsense impressions about the strength of demand. It is suggested below that the pressure of demand for final products may often be different from the pressure of demand for labour; and that in an economy which does not 'explode' when faced with an excess of final demand, the latter will normally not be fully transmitted down to the labour market.

Rigorous exposition of the bearing on this question of the present evidence requires detailed explanation of the methods used to construct the indices of demand and of the principles underlying them. This inevitably is tedious reading to those not closely interested. The text of this paper therefore presents and discusses the main results, but gives only sufficient indication of the methods used to enable readers to judge whether they wish to read the full explanation in the Appendix.

2. Discussion of Methods

Excess demand for labour may be provisionally defined as employers' attempts to hire labour *less* the available labour supply. One can conceive

[1] This study was supported by a grant from the Rockefeller Foundation to the National Institute of Economic and Social Research and also an award by the Leverhulme Trustees to the first author for research, of which this study represents a part, into post-war British economic trends.

of this being a measurable quantity, but even if measurement is impossible it may still be possible to rank variations in the demand for labour relative to supply. The vaguer expression 'pressure of demand for labour' is here used when such a merely ordinal measurement is all that is being claimed.[1]

As a preliminary to constructing indices of the pressure of demand, it was necessary to consider closely the way the statistics of unemployment and of vacancies react to various influences. Though the indices themselves differ only slightly from what would be obtained from a less elaborate treatment of the data, the elaboration is justified by showing clearly the inevitable deficiencies of the data and thus also how much trust may be placed in them as indicators of demand.

There are good *prima facie* reasons for distrusting the statistics of unfilled vacancies since they neither record transactions nor register decisions, but represent a sort of queue. The size of a queue may be either more or less than the real unsatisfied demand: people may either duplicate orders or join several queues; or they may give up trying and not join a queue at all. The unemployment figures, in contrast, are 'hard' statistics: a person can register only once as unemployed and he has a financial reason for doing so.

But the more closely the behaviour of the vacancy statistics is compared with that of the unemployment figures, the clearer it seems that up to a point they are rather reliable indicators. There is a striking inverse parallelism between the seasonal swings of the two series (Fig. 1A). It is equally striking that when seasonal movements are removed, changes in demand still appear to be equally reflected in both series. In Fig. 1B unemployment has been inverted, so that a rise in demand will be associated with a rise in both series as charted: though there has been a slow divergence between them, a striking degree of parallelism remains.[2] These observations give one a certain confidence in the vacancy statistics, which further analysis[3] in general confirms.

The long-period 'divergence' between the unemployment and the vacancy statistics is probably best interpreted as evidence that one or other or each of the series was being affected not only by the demand for labour but also by something else. One possible explanation for the 'fall' in the vacancy curve (Fig. 1B) is that as time went on employers increasingly understated (or decreasingly overstated) their true demand for

[1] See further Section 4 below.

[2] Controls over engagement were in force (see Fig. 1B) for much of the period. With some exceptions, employment had then to be obtained through the employment exchanges. But this does not appear to have affected the number of unfilled vacancies which got reported to the exchanges: see Appendix, (2).

[3] In particular, comparison of the unemployment and vacancy series for separate industry groups; and analysis of their respective seasonalities: see Appendix, (3).

labour. Another explanation is equally plausible. The fact that unfilled vacancies for some sorts of labour coexist with the unemployment of other sorts implies that the kinds of labour demanded differ from those on offer. Some of the unemployment (and of the unfilled vacancies) is therefore due to such maladjustment.[1] Over the post-war years, the labour supply has probably become better adapted to the pattern of demand. If so, *both*

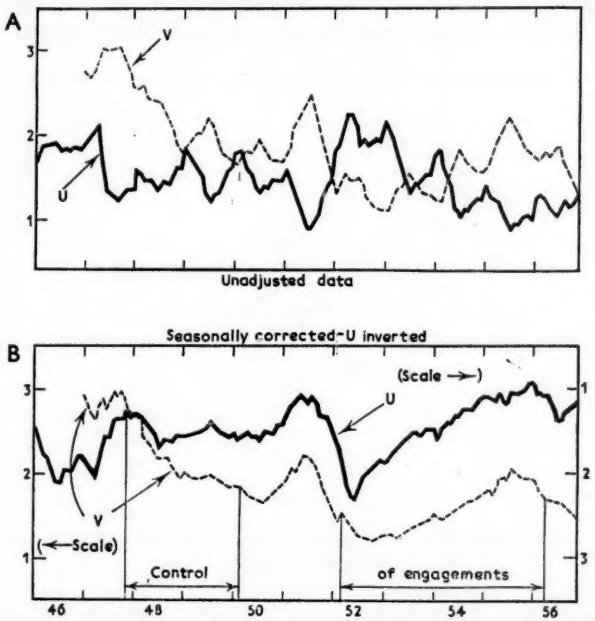


FIG. 1. Unemployment and vacancies, 1946–56 (percentages, Great Britain).

unemployment and unfilled vacancies will have been reduced (*v* lowered and *u* raised on Fig. 1B). Detailed analysis of the figures suggests strongly that this second explanation, namely a fall in labour maladjustment, was the main cause of the divergent trend in the unemployment and vacancy figures.[2] Most of the shift occurred in the early post-war years, and is not much in evidence after 1950.

We must now consider more closely how changes in the pressure of demand can be expected to affect the statistics of unemployment and of

[1] The causes are very various. Most of the unemployed are unskilled, while most of the vacancies are for skilled workers; and vacancies for young people are many times the number of young people employed. Other causes (perhaps partially overlapping those above) are geographical maldistribution, seasonal variation in demand, and the effect of turnover of labour between firms. (In manufacturing the turnover rate is 30–40 per cent. a year and appears to be higher still in the building industry.)

[2] See Appendix, (3).

vacancies. It is convenient to abstract from the effects of the two other things which we have already seen may affect the figures, namely changes in the degree of over- or under-statement of vacancies and changes in labour maladjustment. An increase in the pressure of demand will then always increase the level of unfilled vacancies reported, and reduce unemployment. But even at very high levels of demand there would remain some unemployment, i.e. above a certain point unemployment is decreasingly sensitive to demand. The reverse is true of the statistics of

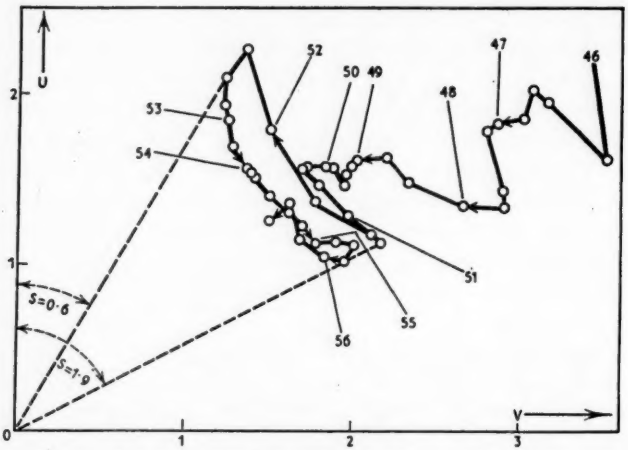


FIG. 2. Relation between unemployment and vacancies (seasonally corrected quarterly figures).

unfilled vacancies. Even when demand was clearly deficient, some unfilled vacancies would remain, so that *below* a certain point the level of vacancies must be reckoned as decreasingly sensitive to demand. Illustrations of these two tendencies appear on Fig. 1B. An example of the first is the boom year 1955 (when unemployment fell less than vacancies rose). The recession year 1952 is an example of the second (vacancies then fell less than unemployment rose).

The same data are shown in another form in Fig. 2, where unemployment is plotted against vacancies. The areas of high and low demand must be thought of as separated by a line through the origin running north-east.[1] Low demand is above and to the left of this line; in this area the *vacancy* figures tend to be insensitive to demand. High demand is below and to the right of the line; and here *unemployment* tends to be insensitive to demand. In the absence of shifts either in labour maladjust-

[1] If employers give a *correct* statement of their vacancies, the line dividing areas of high and low demand would be at exactly 45 degrees through the origin.

ment or in the accuracy with which vacancies are stated, the series of points corresponding to different degrees of demand will lie on a curve which is convex towards the origin.[1]

These considerations underlie the index of the pressure of demand for labour which is presented in this paper. The *rationale* of the calculation is described fully in the Appendix, (1), but the general principles may be briefly described by reference to Fig. 3.

(i) To make use of the data, some estimate is needed of the accuracy

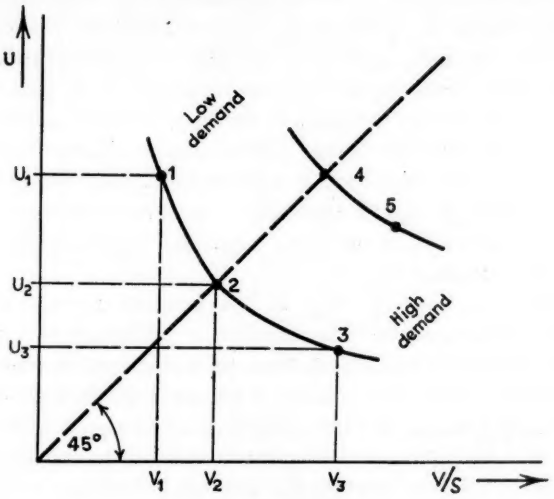


FIG. 3

with which vacancies are stated (defined as a ratio s, being *reported* vacancies divided by *true* vacancies). The points 1, 2, 3, 4, 5, . . . on the diagram represent observed values of unemployment (u) and of vacancies, the number of vacancies reported (v) being corrected for statement error (v/s).

(ii) Zero net excess demand is then to be defined as all points where unemployment equals true vacancies, i.e. the 45-degree line through the origin.

(iii) Successive points on the 45-degree line (e.g. points 2, 4, . . .) correspond to different degrees of *maladjustment*; and the amount of maladjustment may conveniently be measured as the amount of unemployment which would exist at any time if there were zero

[1] The fact that the points for the earlier years do not appear to lie on such a curve is evidence that shifts of the kind just mentioned were occurring in addition to any changes in the pressure of demand.

net excess demand (i.e. at the point where $u = v/s$). Use of the data requires some estimate of the extent of maladjustment.[1]

(iv) For any given degree of maladjustment, there will be a series of points corresponding to different degrees of demand, and lying on a curve convex to the origin (e.g. for the degree of maladjustment measured by u_2 there will be points 1, 2, 3, . . .).

(v) For positions of net excess demand, demand is best measured as true vacancies (= reported vacancies corrected for estimated statement error) *less* estimated maladjustment (e.g. demand at position 3 is measured as $v_3 - u_2 = v_3 - v_2$). Similarly for positions of net deficient demand, demand is measured as estimated maladjustment *less* unemployment (e.g. for position 1, as $u_2 - u_1$).

The index of demand calculated in this way is not a perfect index of the strength of demand for labour. But it can be claimed that it makes full use of the available data and is a better index than either unemployment or unfilled vacancies taken singly. There are however possibilities of error at several stages of the calculation; and the resultant index may be in error in three chief ways.[2]

The division into areas of high or low demand depends (as already explained) on the estimates of statement error.[3] Whether or not vacancies are reported accurately can only be gauged, not known precisely. Hence, the positioning of the zero point is uncertain.[4] In fact, however, it is almost certainly possible to form a fairly good though imperfect idea of the extent of statement error; and in our opinion the positioning of the full employment (or zero excess demand) point is probably not in error by more than about $\pm 0{\cdot}25$ per cent.

Second, for several reasons, the index is very much more reliable as an ordinal than as a cardinal measure of demand. The foregoing account of its method of construction for instance implicitly assumes that if we know that vacancies are truly reported near the zero point, we also know that they will be truly reported when demand is high. But we cannot be certain of this: the statement error itself might be a function of demand. When demand was high employers might either think there was so little

[1] Given observed values of u and v, the amount of maladjustment may be estimated if s is known; or the amount of statement error can be estimated if maladjustment is known: see Appendix, (1).

[2] As well as some other kinds of error: see Appendix, (1).

[3] Cf. Fig. 2, on which two extreme possibilities are shown. If vacancies were seriously under-reported ($s = 0{\cdot}6$) then *all* positions observed would be in the area of deficient demand. Contrariwise if over-reporting were serious ($s = 1{\cdot}9$) all observed positions would be in the area of excess demand.

[4] As a reminder of this possibility the diagrammatic display of the result (Figs. 4–11) is in terms of total demand, not excess demand (i.e. variations shown above or below 100 not around zero), it being intended to be understood that the full employment point (100) is not precisely known.

chance of obtaining recruits that they failed to report many vacancies; or alternatively, they might overstate their demand in the hope that multiplicate notification would increase the chance of results. In either case the statistics of vacancies (and consequently our index) would give a poor measure of the *extent* of excess demand. But in either case they would give a correct *ranking* of the degrees of demand at different times.[1] The present index is therefore presented with some confidence as an ordinal index of demand. Later (Section 4) the question of its accuracy as a cardinal index will be reconsidered.

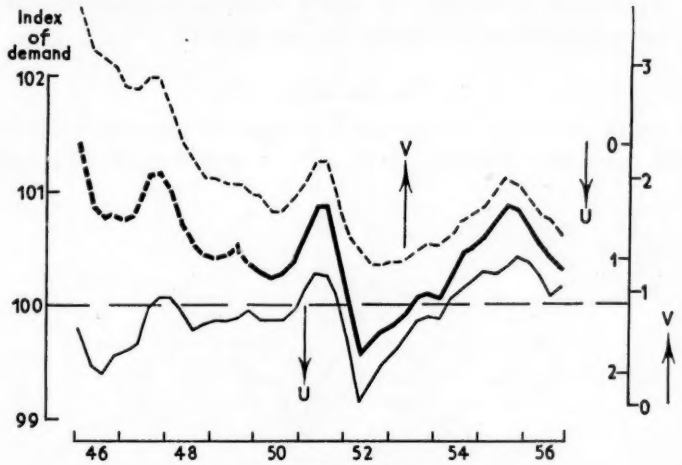


FIG. 4. All industries.

Third, figures for the early post-war years can be interpreted with much less certainty than for the later years. As already explained the figures seem to imply that there was a continuing shift in either maladjustment or statement error or both. For various reasons (Appendix, (3)) the former seems most probable and the results shown are based on this hypothesis. The grounds for this belief do not however compel certainty, and results for the early years are therefore indicated (by dotted lines or bracketed figures) as uncertain. The extreme alternative interpretation would imply that vacancies were rather heavily overstated in the first post-war years; and if this interpretation had been adopted demand in these years would have been indicated as *lower* compared with later years.[2]

To summarize, then, it should be remembered when looking at our indices (as for instance Fig. 4) that:

[1] For some other but less important sources of cardinal inaccuracy, see Appendix, (1).

[2] The alternative reading of the data might put demand in the early years lower by about 1 per cent., so that the index moved parallel to the (inverted) unemployment line.

(i) the position of full employment (zero excess demand) is uncertain, but not completely uncertain: even after making reasonable allowance for possible error, it seems fairly clear that 1951 and 1955 were years of excess demand and 1952 a year of deficient demand;

(ii) indication of the quantitative extent of excess demand becomes more unreliable the greater the degree of excess demand: in 1951 and 1955 excess demand might (*as compared with years of less demand*) be absolutely greater or absolutely less than shown;

(iii) in the early post-war years, demand might *as compared with later years* possibly be somewhat less than shown.

3. The Main Results

All results are based on quarterly averages of unemployment and of unfilled vacancies, seasonally corrected and expressed as percentages of

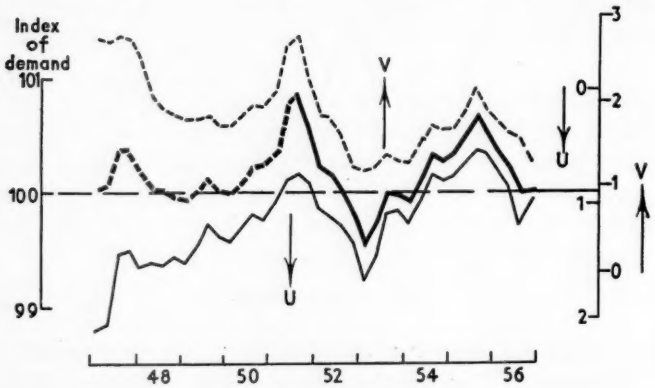


FIG. 5. 'Metal' industries.

the number of employees.[1] Such series were calculated both for Great Britain as a whole and for seven separate industry groups. The derived index of demand for all industries is shown on Fig. 4, and for the seven industry groups on Figs. 5–11. The diagrams also show unemployment (inverted scale) and vacancies.[2]

There are considerable differences between industries. For Great Britain as a whole, unemployment and vacancies have been about as large as each other over most of the period (Table 1 and Fig. 1). The responsiveness of both series to fluctuations in demand has been very similar (Fig. 4).

[1] For statistical sources and methods see Appendix, (2).

[2] The scale for vacancies implicitly corrects for the extent to which vacancies are estimated to have been under- or over-stated. The position of the origins for the unemployment and vacancies scales is arbitrary.

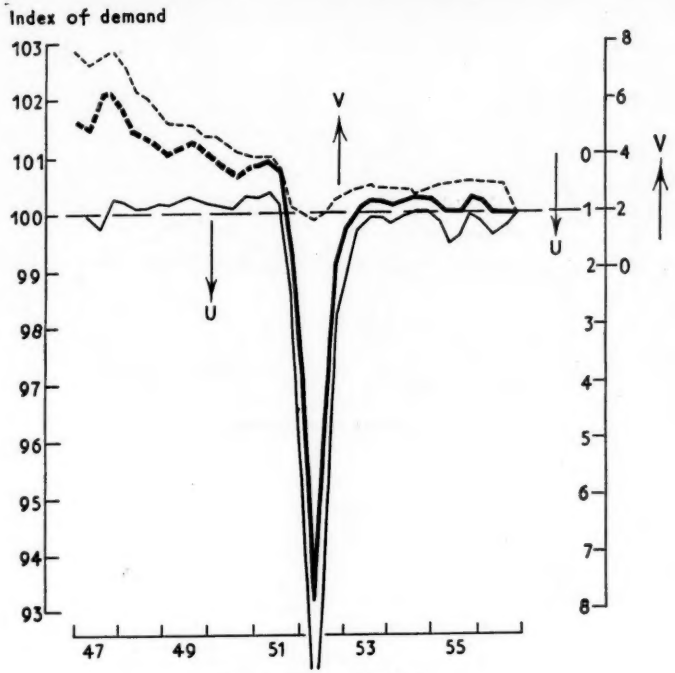
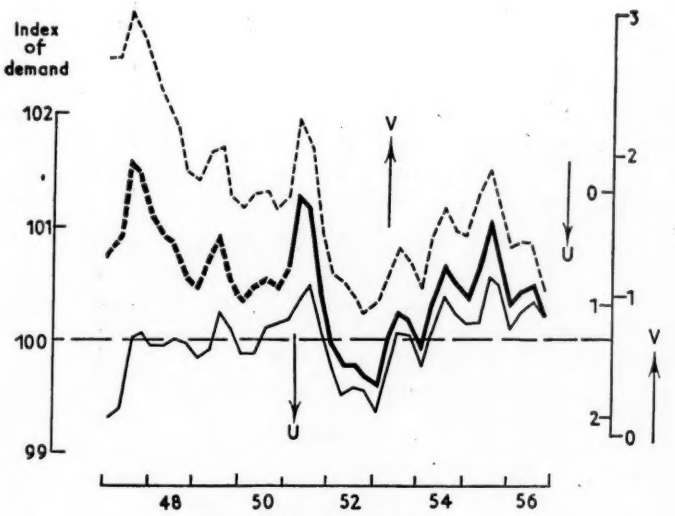


FIG. 6. 'Textile' industries.



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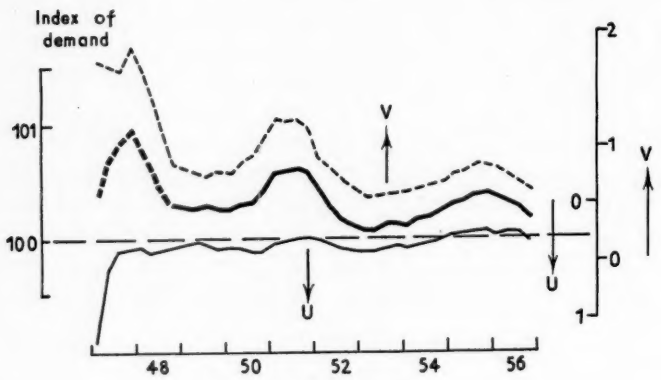

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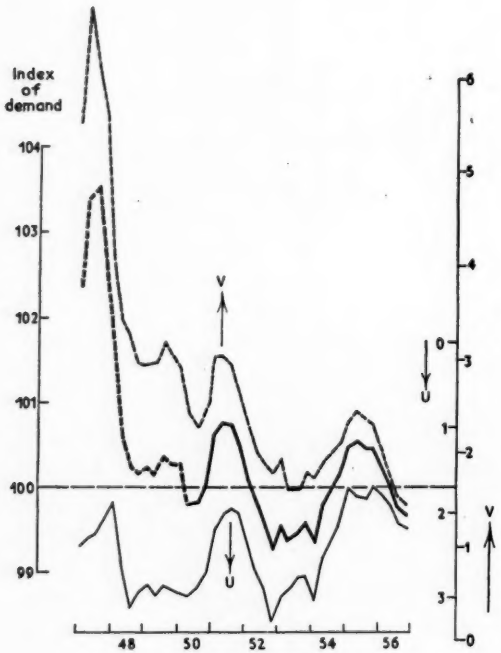

FIG. 9. 'Building'.

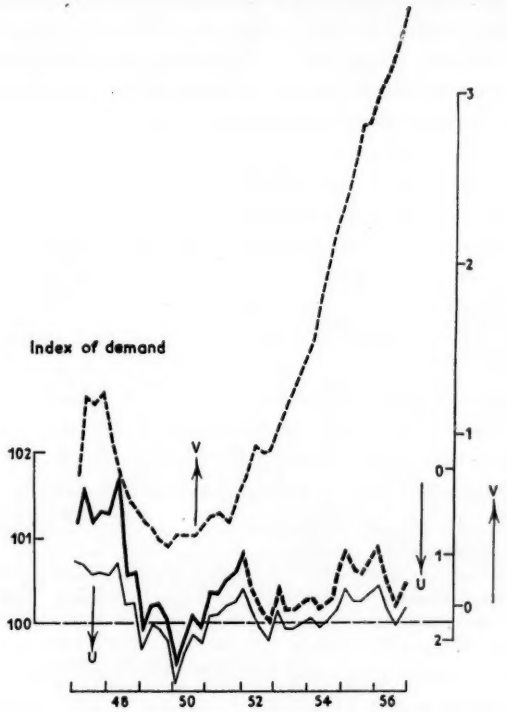

FIG. 10. 'Agriculture'.

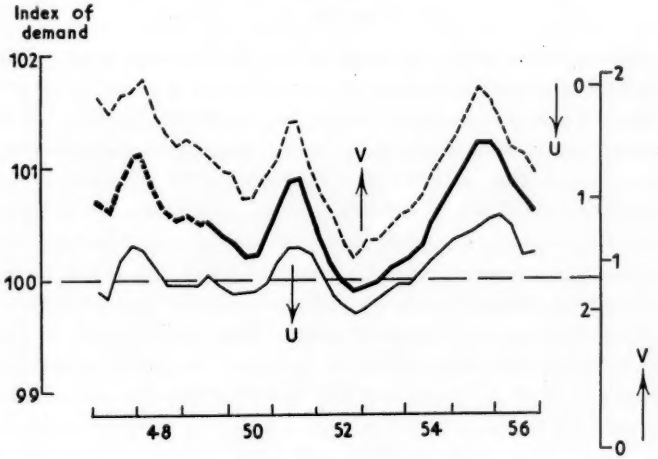

FIG. 11. Services.

This suggests that, for all industries taken together, vacancies were about correctly stated. In the *Textiles* group, vacancies were much larger than unemployment (Table 1) and it seems almost certain that vacancies were *over*stated. In the *Agriculture* group for most of the period and in *Services* vacancies seem to have been *under*stated.[1]

TABLE 1

Data for Seven Industry Groups

Industry group (short title in italics)	*Weight mid-1948**	*S.I.C. Order*	*Average 1947–55*		*Estimated statement ratio*
			u	*v*	
Metals, engineering and vehicles	20	V to IX	1·2	1·9	1·3
Textiles, leather and clothing	8	X to XII	1·6	4·2	2·0
Other manufacturing	12	III, IV, and XIII to XVI	1·3	1·8	0·8
Manufacturing	40	..	1·3	2·3	1·3
Mining and quarrying and public utilities	6	II and XVIII	0·4	0·9	1·0
Building and contracting	6	XVII	2·6	2·9	0·9
Agriculture, forestry, and fishing	4	I	1·7	1·1	0·4 incr. to 1·0
Services	44	XIX to XXIV	1·6	1·5	0·6
Non-manufacturing	60	..	1·6	1·6	0·7
All industries	100	..	1·5	1·9	1·0

* Based on number of employees.

The main claim made for the indices is that, at least in years from 1950 on, they show which were times of higher and which times of lower demand for labour. There seems little reason to doubt the ranking shown in Fig. 4 of years since 1950, for both the unemployment and unfilled vacancy figures tell much the same story. The figures for the early years are more ambiguous, and (as already explained) demand could be lower than shown: but this appears unlikely on the evidence and implausible in view of the general impression of high demand after the war. As already emphasized, less confident claims are made for the position of the full employment (zero excess demand) point. But that shown also appears commonsensically plausible, with the recession year 1952 below the line, and others above. (The question of the *scale* of excess demand is considered later.)

The all-industries index was derived not directly from the all-industries'

[1] For elaboration of these points see Appendix, (3).

figures of unemployment and vacancies; but as the weighted average of the indices for the seven industry groups. These were based primarily on the unemployment and vacancies data for each group, but in addition regard was also paid to the trend of *hours worked* and of *employment*: the rate of *labour turnover* was considered as evidence of labour demand, but not found useful.[1] The use of this additional evidence probably improves the indices chiefly as regards the positioning of the zero point. But this remains subject to some error, particularly for the important group, *Services*. Inter-industry comparison is therefore hazardous. The data for *Agriculture* were unique in that here alone was there clear evidence of a change in the habits of reporting vacancies (see Table 1), probably resulting from regulations about conscription which affected *Agriculture* but not other industries.[1]

The results for separate industries are summarized in Table 2, which is designed to give an impression of the relative importance of the various industry groups. In view of the inexactness of inter-industry comparisons, the separate indices are shown only to the nearest whole number. For the same reason, the indication of industrial dispersion at the bottom of the table cannot be regarded as very accurate. Nevertheless, this measure of dispersion, as well as the pattern of the table as a whole, probably gives some idea of the uneven incidence of demand. The figures suggest that only in the first two years, and to a less extent in 1951, was significant excess demand anything like universal in all industries.

In Table 2 the results are for simplicity of presentation shown as an index of excess demand (i.e. not of total demand). This does not mean that great claims are made for their accuracy as a cardinal index. If the ordinal aspects only of the results are considered, the successive phases of pressure or slackness in different industries probably conform to the usual impressions of the period. It is plausible that just after the war, demand should be highest in *Building* and *Textiles*; and lowest in *Metals*, which had been expanded in war beyond peacetime needs. The boom in 1951 appears to have affected all industries except *Textiles*, by then already affected by a premonition of the recession in 1952. This recession was severe in *Textiles*; but (in terms of demand for labour) it was very localized. In most years the demand for labour in *Services* appears to have followed the national average closely, which is perhaps comprehensible. In 1955 and 1956, however, it appears to have crept above the average: though this is puzzling, there is no obvious reason to reject the results shown by the index.

The unreliability of the index as a cardinal measure of demand was briefly explained in Section 2. The index, however, is not necessarily

[1] See Appendix, (3).

TABLE 2

Summary: Excess Demand 1947–56

Percentages of total employees
Vertical spacing indicates weights

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
Metals	(0)	(0)	(0)	(0)	1	0	0	0	1	0
Textiles	(2)	(1)	(1)	(1)	0	−4	0	0	0	0
Other manufacturing	(1)	(1)	(1)	(0)	1	0	0	0	1	0
Mining, &c.	(1)	(1)	0	0	1	0	0	0	0	0
Building	(3)	(1)	(0)	0	1	0	0	0	0	0
Agriculture	1	1	0	0	0	(0)	(0)	(0)	(1)	(1)
Services	1	1	0	0	1	0	0	0	1	1
All industries average	(0·8)	(0·7)	(0·4)	0·3	0·7	−0·3	0	0·3	0·7	0·5
Mean industrial dispersion	± 0·5	± 0·4	± 0·2	± 0·1	± 0·1	± 0·6	± 0·1	± 0·2	± 0·4	± 0·3

Source: Appendix, (3).

completely misleading; and in our opinion there is reason to believe that it gives a good idea of the order of magnitude of excess demand for labour (i.e. nearer to 1 or 2 per cent. than to 10 per cent.). Since this is probably smaller than most people would believe, it is an important conclusion.

The main reasons for this belief are as follows. The index could give

an extreme understatement only if vacancies after a point became extremely insensitive to the increase of demand. Comparison of the behaviour of the vacancy statistics with that of unemployment shows no sign of such insensitivity at the upper end of the range, either for Great Britain as a whole or for separate industries (see Figs. 4–11). Admittedly, the range of variations shown by the vacancy figures is not large;[1] but within the observed range of variation we do not believe they grossly understate. They do therefore seem to us to be worth considering as evidence that the excess demand for labour even in boom years was of the order of a few per cent. only. Section 4 below considers this rather surprising conclusion.

4. Discussion of Results

The present results would, in our view, be enough to persuade anyone without previous knowledge of the economic history of the post-war decade that the excess demand for labour was very moderate. But the levels indicated are certainly much less than anyone would believe without looking at the present evidence. It is therefore necessary to consider whether it is possible to reconcile the present evidence with previous impressions.

Two minor points should be made. The question whether there was much or little excess demand for labour is a question of fact, without implication for economic policy: if the excess was small, this does not mean that policy which aimed at its elimination was misguided. The implications for policy depend on the *consequences* of excess demand, which are not discussed here; but the discussion below may suggest that if the level of demand be a target of policy, the target should be conceived in terms of the demand for products, and not in terms of the demand for labour at all.

Our index is an index of *net* excess demand. Thus in 1956 unfilled vacancies amounted to 1·7 per cent. of employees. Of these, vacancies corresponding to 1·2 per cent. are treated as due to maladjustment, i.e. 'matched' by kinds of labour in excess *supply*. Net excess demand is stated as 0·5 per cent. We do not know whether the kinds of labour which were in short supply were few or many. But if they could be segregated, excess demand calculated as a percentage of the total supply of these kinds of labour would of course be higher than our percentages. This might be called an index of gross demand. In fact we do not have enough information to construct such an index; and even if we could, an index of net excess demand would remain convenient as a summary

[1] Taking annual averages only, the highest vacancy figure for all industries is 3·2 per cent. in 1946. *Textiles* had 7·5 per cent. vacancies in 1947; see final table in Appendix.

aggregate measure. The use of a net index does not imply that policy should ignore the maldistribution of labour. Ideally the amount of detail should certainly be extended beyond disaggregation into seven industry groups as given here.[1]

Two major points are worth discussing. First, it may be argued that excess demand is a subjective entity, not measurable by *ex post* statistics: some discussion of the concept of excess demand is therefore in order. Second, it has to be considered how the demand for labour and the demand for products are related: this bears very directly on the main question at issue, namely the creditability of the present results; and is interesting in its own right as throwing light on the working of the economy under inflationary conditions.

The Concept of Excess Demand

Though a subjective entity, excess demand may be defined in 'operational' terms, e.g. in terms of the amount of labour that employers would employ at the current wage if employees of the right sorts and skills were to present themselves at the factory gate for employment.[2] This in principle is measurable. But it can be argued that *ex ante* demand is different from anything shown by *ex post* statistics; and in particular that excess demand *ex ante* will itself modify the situation, so that statistics *ex post* will show the situation only as modified.

Much of the discussion, particularly in Sweden,[3] of the working of demand inflation has been based on the analysis of the consequences of disappointment of expectations. In such a framework, the excess demand for labour may be defined in *ex ante* terms as intended 'purchases' of labour services by employers less expected 'sales' by employees.

Analysis in these terms is profitable only if the economy reacts rather rapidly to disequilibrium situations. The incompatibility of the plans of different groups then constitutes a force propelling the economy through successive acts of adjustment, the stages of which may be analysed in

[1] This is a convenient place at which to propose various ways by which the Ministry of Labour statistics of unemployment and unfilled vacancies might be improved, chiefly as regards presentation, along the following lines: (i) Sub-totals for main industrial groups should be published, e.g. for those industries separately distinguished in the index of production together with *Agriculture* and at least three *Service* groups. (ii) An attempt should be made even at the cost of some arbitrariness to distinguish skilled from unskilled workers. (iii) It would be convenient if figures were published in percentage form, and with seasonal correction.

[2] It is a separate question whether the excess demands of different employers would be found to be compatible if they all were to obtain the labour they thought they wanted. It might then be found for instance that more than one was aiming to meet the same shortage of final goods. Definitions are a matter of choice; excess demand for labour is here conceived in terms of the labour employers think they want.

[3] See particularly Bent Hansen, *A Study in the Theory of Inflation* (English edition: London, Allen and Unwin, 1951).

terms of the reaction of different groups to disappointment in their expectations. Thus it is certainly useful to analyse in these terms the adjustment of output and employment to a change in demand (i.e. in conditions of less than full employment); and it may sometimes be useful to analyse price adjustments in these terms. But if the adjustment to excess demand, whether of output or of prices, is fairly rapid, the average level of excess demand over a period (which alone is statistically measurable) is devoid of much interest. For during the process of adjustment, the level of excess demand will be reduced, and a measure of its average value over the period will fail to measure the force producing the adjustment.[1]

In the extreme case, if prices were freely determined by demand, the rise in prices would go on till it had eliminated the excess demand in any particular market. Excess demand would then be a very transitory phenomenon, though one that might well be constantly recreated as a result of interactions between different markets or sectors. Thus a rise in wages produced by, and eliminating, excess demand for labour would raise money demand for final products, which would raise final prices, and would thus recreate an excess demand for labour; and so on. Reflection on this process suggests that where prices are at all freely determined by demand, the price level must be subject to very large and rapid change. It seems clear that in the United Kingdom prices and wages are far from volatile in this sense; and that a condition of excess demand for a product or for labour does not normally tend rapidly to be eliminated by price or wage changes, but may persist for years.

Two conclusions follow. First, an alternative approach to the theory of inflation seems more relevant to this country. Analysis in terms of incompatible expectations seems unsuitable because expectations get adjusted to the facts of life and cease to be incompatible: all employees expect employment, while employers hardly expect the extra labour they want. It seems more sensible to define available supplies in objective, not *ex ante*, terms;[2] and to define excess demand as 'attempts to purchase' less 'available supplies'.[3] Second, it would seem that the kind of wage and price changes that occur in the course of a period like a year in this country have in fact been insufficient greatly to modify the extent of excess demand.

[1] See R. Turvey, 'A Further Note on the Inflationary Gap', *Ekonomisk Tidskrift*, 1949; B. Hansen, op. cit., pp. 78–82; and E. Lundberg, *Business Cycles and Economic Policy* (London, Allen and Unwin, 1957).

[2] Both potential output and total labour supply are probably *slightly* increasing functions of the pressure of demand. To obtain a unique measure each may be measured as output forthcoming or labour supply available *at the full employment point*: compare the definition of 'maladjustment' in Section 2 above.

[3] Hansen calls this concept, which he traces to Keynes's *How to Pay for the War*, the 'inflationary gap' formulation, as opposed to the *ex ante* formulation. Hansen's definition is in terms of 'active attempts' to purchase. But even 'passive desires' for goods might be important.

In these conditions it is sensible to try and measure excess demand statistically, since it is a more than transitory phenomenon.

Excess Demand for Labour and for Final Products

Except for direct personal services, the demand for labour is related to that for final products only *via* the mediation of entrepreneurs; and may thus diverge from it. There are reasons to believe that in an economy which does not react violently to a condition of excess demand, an excess demand for products will be considerably damped in the course of transmission to the labour market:

(i) There may be what amounts to implicit collusion between employers so as to avoid 'spoiling' the labour market: not only may they refrain from bidding up wages,[1] but also from trying to get all the labour it would be profitable to employ.[2]

(ii) In many cases labour may not be the shortest factor, e.g. the bottleneck may be plant capacity, materials, or entrepreneurial resources; or even if some kinds of labour are the bottleneck, their 'non-availability' may prevent labour as a whole being in great demand.

(iii) Demand for final products may be rationed or controlled; and even without legal controls, firms may act in a way which in fact inhibits the transmission of demand just as effectively, e.g. by refraining from efforts to meet the demand.

In the early post-war years the various restraints on demand were particularly severe. Much final expenditure was rationed, or restrained by shortages *plus* price control; many materials were allocated; plant capacity may at times have been inadequate for the labour force;[3] and the task of restarting civilian production, and of absorbing the millions released by the Armed Forces, may well have kept employers too busy to want yet further labour. Excess demand may therefore have been effectively suppressed at the product market stage, so that relatively little worked through to the labour market.

It can be argued that a similar mechanism has been at work in later, more 'normal' years. By 1950 or so, direct controls though effective in some sectors can hardly have been sufficiently comprehensive to act as a general barrier to demand. But it is doubtful whether the legal institution of control makes a crucial difference to entrepreneurs' behaviour.[4] Thus

[1] A theoretical article on this point is by G. C. Archibald, 'The Factor Gap', in the *Economic Record* for Nov. 1954.

[2] Members of many trade associations are enjoined by the rules of the association not to give employment to the employees of a fellow member without his knowledge and consent.

[3] This is doubtful: even in 1948 most industries employed less labour than in their previous peak year (1939 for other than 'war' industries).

[4] As Professor Galbraith points out, it is difficult to enforce a legal control in a market

it may be the normal reaction of an economy like that of Great Britain simply to 'suppress' a large excess demand for products.[1] It is certainly true that in recent boom years there have been many cases of shortages, where the response has been neither a marked price-rise to 'eliminate' the gap, nor a notably rapid increase in output in response to the excess demand.

It is difficult to avoid the conclusion that, with such a response (or lack of response), the labour market must be partially insulated from excess demand conditions. Such a lack of response is not evidence of obstructive psychology or inefficiency on the part of entrepreneurs. Modern industries, like modern armies, are unwieldy organizations. It may take some years of even relatively rapid advance to work off an excess demand. An example is the motor industry, where, though output has been increasing rapidly since the war, excess demand took years to work off and is still liable to recur. It is not to be expected that such excess demand would get reflected in the labour market,[2] for it would require far more than the hiring of labour to meet it. The question has probably to be understood in terms of investment behaviour.[3]

The argument is, then, that the post-war period has been characterized by many sorts of rigidity or slowness of response, the effects of which must interlock and reinforce each other;[4] and, in particular, that entrepreneurs do not respond fully to excess final demand and do not therefore transmit it in full force to the market for labour.[5] Now there is little doubt that

where there are numerous, competitive sellers. Where competition is restricted, control is relatively easy simply because it gives no more than legal sanction to what businessmen would anyhow wish to do. He remarks that 'demand in the imperfectly or monopolistically competitive market, especially those that are characterized by small numbers, is subject to an informal control by the seller which is frequently the effective equivalent of rationing'; and that 'the effect of a well-designed system of price control in markets of this kind is merely to continue accepted rules' (*The Theory of Price Control*, Cambridge, Mass., Harvard University Press, 1952, pp. 11 and 18). This does not necessarily imply that direct controls are useless. Under conditions of great strain, they may protect established behaviour-patterns from gradual erosion.

[1] Cf. Mr. Harrod's remark that delivery delays may be 'part of the normal functioning of an inflationary economy' ('The British Boom, 1954–5', *Economic Journal*, Mar. 1956).

[2] In 1951, for instance, the delivery delay for popular makes was many months. This probably means that for a year or so at least, manufacturers could have sold say 25 per cent. more cars than they were producing. Unfilled vacancies in motor manufacturing were no more than 1½ to 2 per cent. of total employees.

[3] Not only does investment take time to show results in output, but in many cases the decision to invest in response to excess demand may be delayed. If firms do not need to fear new entrants, they can afford to take their time in exploiting market opportunities, and may prefer gradual expansion because of their preference for financing investment (at least in large part) out of retained profits. Cf. the discussion in J. R. Meyer and E. Kuh, *The Investment Decision* (Cambridge, Mass., Harvard University Press, 1957).

[4] The general disposition to accept a 'shortage' is both result and cause of this lack of response.

[5] As an exception it should be noted that such recessions in demand as have occurred in the post-war period have usually been believed to be *temporary*; and the demand for labour has then been *greater* than the demand for final products. Thus both textile firms in 1952 and motor firms in 1956 retained labour beyond the numbers required for current output.

there was in many years a considerable excess demand for products; but assertions of excess demand *for labour* seem to have been based as much as anything on impressions of general shortage,[1] and in some cases at least a view so based would have been erroneous.[2] It may therefore be that the indices described here do not present a completely misleading impression of the extent of excess demand for labour, and that their evidence should not be rejected out of hand.

APPENDIX

(1) Principles of Measurement

THE methods used here to measure the pressure of labour demand, described in general terms in Section 1 of the text, are described more precisely below. In the following discussion

u = unemployment, seasonally corrected, as a percentage of employees;
v = unfilled vacancies, also as a seasonally corrected percentage;
s = the *statement ratio*, i.e. unfilled vacancies reported to employment exchanges as a proportion of true unfilled vacancies;
m = the amount of percentage unemployment to be attributed to the *maldistribution* of the labour force (measured as described later);
d = the index of pressure of demand for labour, being positive for excess and negative for deficient demand.

Account clearly has to be taken of any mis-statement by employers of their vacancies. First, ignore this possibility (i.e. assume $s = 1$) so as to consider how far u and v will reflect changes in demand. It may be assumed that as demand increases, u will decrease continuously (see A on Fig. A1), but since it cannot shrink below zero it must be supposed to become decreasingly sensitive. Conversely v may be taken to shrink and become decreasingly sensitive, as demand *falls*. There is, therefore, a point where $u = v$, i.e. where there is zero net excess demand. The amount of unemployment at this point may be taken as the measure of *maladjustment* (m). If the statement ratio is greater or less than unity, the definitions must be adjusted accordingly:

(1) Zero net excess demand ($d = 0$) is defined as the point where $u = v/s$.
(2) *Maladjustment* is defined as the amount of unemployment at the point where $u = v/s$.

The case where $s > 1$ is shown on Fig. A1 at C and D; and the case where $s < 1$ is shown at E and F.

If there were no maladjustment it follows by definition that unemployment would decline to zero before there were any vacancies, and that vacancies would decline to zero before there was any unemployment. Under these conditions there seems

[1] For instance, the *Economic Survey for 1947* said: 'whether we reckon in manpower, coal or electricity, steel or national production as a whole, the conclusion is unavoidable. To get all we want production would have to be increased by at least 25 per cent.' (Cmd. 7046, p. 16.) Excess demand for products may well have been of the order of 25 per cent. or even higher; but the precise figure need not be taken too literally. It was an estimate based on the 'economic budgets' prepared as part of the machinery of planning, and described on p. 6 of the *Survey*; and was compiled by addition of the demands submitted by Departments on their own account or on behalf of the private needs which they 'sponsored'.

[2] The coal shortage has often been spoken of as a labour problem; yet the National Coal Board is known at times to have found it difficult to absorb recruits.

no reason why both u and v should not be taken to reflect demand accurately (provided only $s = 1$); and this is assumed by the straight line (00) at A on Fig. A1. In this case the relation between u and v (see B on Fig. A1) will be represented by a right-angled 'curve', passing through the origin, and coinciding with the axes. This is the extreme case of the family of *curves convex towards the origin* also shown 1, 2 ... at B on Fig. A1 (the numbering of the curves corresponding to the different values of m).

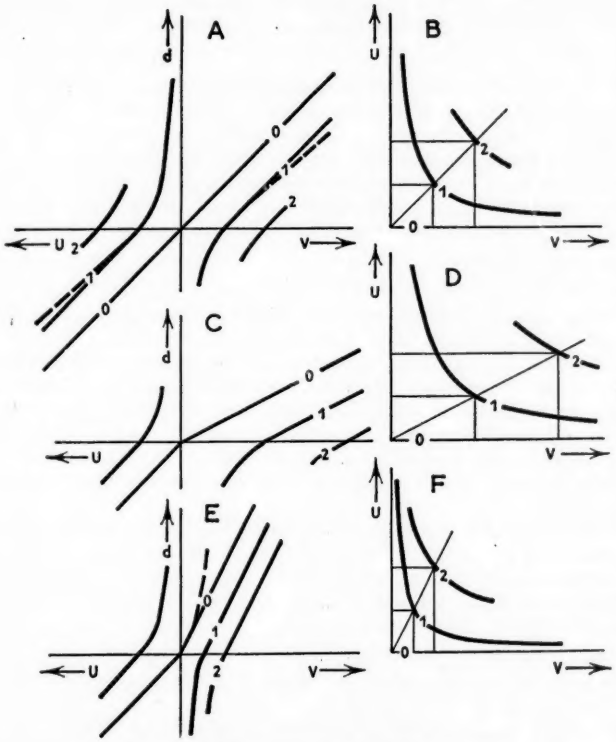

FIG. A1. Relations between u and v and demand.

In fact there will always be a degree of maladjustment, so that with zero excess demand there will be both unemployment and unfilled vacancies. Above this point unemployment and below it vacancies become increasingly insensitive.[1]

[1] It may be asked whether the sensitivity of unemployment to changes in demand could also vary below the dividing line. In fact any variation is probably unimportant, and the diagrams *assume* a perfect relation, i.e. that $d+m = u$. A refinement not taken account of here is however possibly desirable. When demand falls, some of those who leave employment fall out of the statistical labour force, and are not included among the unemployed. It can be argued that the rise in u understates the fall in demand, and that the fall in the working population associated with the fall in demand should be added in.

The diagrams also assume not that vacancies are a perfect measure, but that if imperfect, the imperfection (s) is constant. This assumption is modified later.

Consequently we have the following rule:

(3) Net excess demand (d) is best measured as $m-u$, where $u > v/s$; or by $v/s-m$, where $u < v/s$.

Within a margin of the dividing line it will in fact be immaterial which indicator is used.

Consider now the right-hand side of Fig. A1. Each of the curves shows how unemployment falls as vacancies rise, assuming that maladjustment and statement ratio are both constant. In the calculation of the index it is assumed that these curves are rectangular hyperbolae, i.e. it is assumed that:

(4) $m = \sqrt{uv/s}$, or $s = uv/m^2$.

The convenience of this assumption is that given an estimate of s and the observed values of u and v, the value of m can be calculated. The justification for the assumption is that the range of observations being narrow, the curvature cannot anyhow be great so that the precise assumption about the shape of the curve is not critical. A curve like a rectangular hyperbola seems plausible. Any curve, of whatever shape, which falls from left to right will preserve the correct ranking of observations.

By combination of (3) and (4) above, the following formula is obtained:

(5) $d = \sqrt{uv/s}-u$ where $u > v/s$, or
$d = v/s-\sqrt{uv/s}$ where $u < v/s$.

A commonsense way of measuring the strength of demand for labour is simply to subtract unemployment from unfilled vacancies. Provided that $s = 1$, the resulting index can be little different from our index; and the present analysis can be taken to justify the use of this method as a short-cut approximation.[1] If, however, there is considerable mis-statement, the results are rather different. Our index is therefore better than this short-cut method for estimating demand in different industries.[2]

Having explained the method of calculation and given its justification, we must now explain its inadequacies. They are of several different sorts, which must be described in turn.

As will be shown in Section (3) of this Appendix, we can usually infer whether and by about how much vacancies are mis-stated. But since the knowledge is not exact we do not know how heavily to weight the evidence of vacancies as against those of unemployment. This defect is basic, and as a result the index of demand will suffer two types of inexactitude.

(i) From definition (1) above it will be seen that doubt about the size of the statement error will mean that the point of zero excess demand cannot be accurately identified.

(ii) From definition (3) it will be seen that demand when excessive is measured as reported vacancies corrected for statement error; doubt about the latter will mean that the index is inaccurate as a quantitative index of excess demand.

This latter kind of uncertainty is moreover greater than has yet been indicated. So far it has been tacitly assumed that the statement error whether large or small is

[1] Provided $s = 1$, our index $v-m$ must approximate to $v-u$ in the range where $v > u$, u here being little smaller than m. Similarly $m-u$ must approximate to $v-u$ in the range where $v < u$, v here being little smaller than m. For all industries $s \simeq 1$: the annual results (A) of our index and (B) of measuring demand as vacancies *less* unemployment are:

	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
A	1·0	0·8	0·7	0·4	0·3	0·7	−0·3	0	0·3	0·7	0·5
B	1·4	1·1	0·8	0·4	0·2	0·8	−0·6	−0·3	0·2	0·8	0·5

[2] The *ranking* of the strength of demand in different industries over the post-war period given by the short-cut formula differs completely from the ranking given by our formula.

constant and in particular is independent of the level of demand. But it might quite plausibly be supposed to be either an increasing or a decreasing function of demand. This is the chief reason for distrusting our index as a cardinal measure. In the latter case, for instance, our index (which assumes constant s) would understate demand progressively as demand increased. The *ranking* of different points would however be correctly stated.

The above inaccuracies arise even if both m and s are constant over time, so that all values of u and v lie on a single curve. The historical data are such (Fig. 2 above) that this cannot in fact be supposed to be the case. Fig. A2 shows the elements of the situation to be explained: several points which appear to lie on one curve, and one (or more) points (as it happens, previous in time) lying well above it. To explain

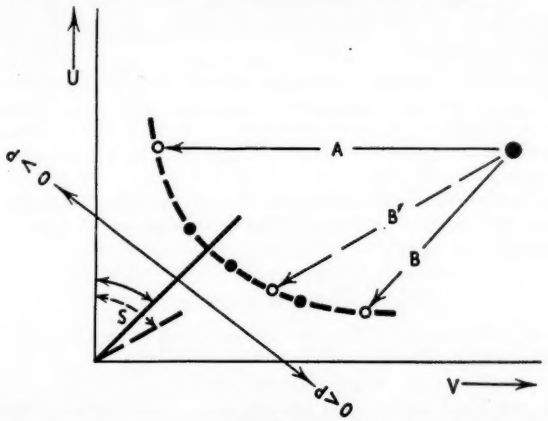

FIG. A2. Effect of changes: (A) In 'maladjustment'; (B) In 'statement error'.

this it must be supposed that there was either a decline in maladjustment; or in the statement ratio; or both. The interpretation of the data stands to be much affected by the choice between these two explanations.

(i) If vacancies were overstated at the beginning of the period, or understated at the end, we should have to attach less weight to the early than the late readings of v. (The appropriate adjustment is indicated by the *horizontal* arrow (A) on Fig. A2.) Since the initial value of v is regarded as relatively inflated, and since u is initially high, this interpretation would result in a *low* estimate of initial demand.

(ii) To suppose that maladjustment had declined over the period is to suppose that the importance of both 'frictional' unemployment and 'frictional' vacancies was greater initially than later, so that *both* vacancies and unemployment would require adjustment. (The appropriate adjustment is shown by the sloping arrow (B), the slope of which depends on the value of s.) This interpretation, therefore, would result in a *high* estimate of demand.

There is thus a possibility of major error unless good grounds can be found for preferring one and excluding the other of these two possible explanations. Examination of the data suggests that in fact shifts in maladjustment have been important and that the statement ratio has generally been fairly constant (see Section (3) of this Appendix). These inferences, however, are indirect and not firm enough to exclude the possibility of a small shift in s along with a considerable shift in m.

There are two sources of subsidiary error:

(i) The adjustments depicted in Fig. A2 may involve some extrapolation of the curve beyond the range observed, and our calculations extrapolate a hyperbola. Though this is merely an assumption, the justification already given still applies, namely any curve sloping downwards to the right will give the right rank order. There is therefore no error for an ordinal index. The possible error for a cardinal index is small compared with other sources of possible error.

(ii) In the second type of adjustment (B on Fig. A2) the ranking of points may depend on the assumed value of s (i.e. the slope of B). But any error so arising will be less than would arise from a wrong choice of the type of adjustment (i.e. A as against B), to choose between which in any case requires some knowledge of the value of s. The additional error arising in this way is therefore probably fairly small.

Taken together the various uncertainties mean (i) that the positioning of the point of zero excess demand is uncertain; (ii) that the ranking of early years compared with later years is generally uncertain; and (iii) that the index may be misleading as a cardinal measure. If we knew how large statement error was none of these uncertainties would exist. As it is we have only indirect evidence on this question (see Section (3) of this Appendix) which is enough to suggest limits to what the statement error could be. Our opinion of the likely size of the above types of error is indicated in the text.

(2) Description of Basic Data[1]

The industrial classification follows the current *standard industrial classification* (see Table 1 of text) which differs from that in use before mid-1948. The broad industry groups considered here can be defined in approximately the same way (though not perfectly for non-manufacturing groups) on the old and new classifications.

Before 1948 unemployment insurance was not universal and the statistics include only insured unemployed. The introduction of universal insurance however increased recorded unemployment by only 4 per cent.: hence no adjustment was made for this discontinuity.[2] In the first quarter of 1947 unemployment was affected by the fuel crisis: the figure shown in the table is the average of the subsequent and following quarter.

The Ministry of Labour collects figures of vacancies reported to the employment exchanges and not filled at the end of successive four-week periods.[3] It is understood that vacancies are not recorded as unfilled at the end of the period without confirming with employers that the vacancies remain. Employers are allowed to give a general indication only to the exchanges that they have unfilled vacancies, and when demand is high they may well prefer to do so. Such standing orders being unquantified are not included in the statistics, but inquiry made by the Ministry at our request suggests that this practice is not widespread. Figures for separate industries have been published only since 1952; those for earlier years were made available by the Ministry.

During the greater part of the period studied it was compulsory for persons

[1] Quarterly, seasonally corrected, percentage figures for unemployment and unfilled vacancies are given in full in Table A3, along with quarterly figures for the derived indices of demand.

[2] For the effects of the introduction of the National Insurance and National Insurance (Industrial Injuries) Acts in the middle of 1948, see *Ministry of Labour Gazette*, Aug. 1948 (p. 260), and Feb. 1949 (pp. 40–41).

[3] Since the beginning of 1957 the vacancy figures have been collected for periods successively of 4, 4, and 5 weeks.

coming within the scope of the various orders controlling engagement to be engaged for employment through local offices of the Ministry of Labour or approved employment agencies. From 1945 to 1947 controls were progressively relaxed; from the beginning of 1950 to the beginning of 1952 there was no control; and controls were again removed at the beginning of 1956. The orders successively in force were:

(i) The 1945 Control of Engagement Order remained in force till October 1947, but its scope was progressively reduced by the exclusion of various trades and of certain age-groups.[1] In addition under war-time Essential Works Orders, also progressively revoked, the right to leave or discharge was restricted in many industries.
(ii) In October 1947 the Control of Engagement Order broadly re-established the conditions of the 1945 Order.
(iii) In March 1950 the 1947 Order was revoked.
(iv) In February 1952 the Notification of Vacancies Order again provided that those coming within its scope must obtain employment through local offices of the Ministry or approved agencies: it did not apply to coal mining or agriculture.[2]
(v) In April 1956 the 1952 Order was revoked.

These statutory changes appear to have had considerable effect on the use made of the exchanges for placing labour (see Table in Section (3) of this Appendix), but to have had relatively little effect on the level of vacancies recorded as unfilled. Estimates made by the Ministry of Labour suggest that when controls came off in 1950, *vacancies* may have been reduced (from 1·8) by 0·15 per cent.; that when they came on again in 1952, vacancies may have been increased (from 1·4) by 0·2 per cent.; and that their removal in 1956 had little or no effect.[3]

Estimates were required of numbers of employees in order to express both unemployment and unfilled vacancies as percentages. The introduction in 1948 of universal insurance against unemployment considerably increased the coverage of the statistics of employees. The simultaneous change in the method of counting part-time workers also made an appreciable difference.[4] The differences were particularly great for the non-manufacturing groups. For dates before 1948, employment on the new definition was estimated by linking to the new series for each group the movement shown by the old series for the (approximately similar) group. The employment series before 1948 are the least reliable data; but since they are used only as denominators, the effect of errors must be small. Since resultant percentages stood to be little affected, mid-year employment figures only were used.

Seasonal correction factors were calculated for the monthly unemployment and the four-weekly vacancy series. Absolute deviations were taken from the moving averages (in general over the period 1948–55), extreme deviations being discounted. There was no attempt to make direct correction for fluctuations in weather or date of holidays. The corrections appeared from inspection to be reasonably satisfactory. The seasonal adjustments both to the unemployment and to the vacancy series for the manufacturing industries were very small, and were regarded as not significant. The seasonal adjustments for *all industries* were estimated directly, i.e. not by combining the factors for separate industry groups.

[1] The original regulation applied to men aged 18–50 and women aged 18–40. For details see Ministry of Labour, *Annual Reports* for years 1939–46 (pp. 170–3) and 1947 (pp. 32–33).

[2] The age-limits were wider than under previous orders: for men 18–64, for women 18–59. For details see Ministry of Labour, *Annual Report* for 1952 (pp. 20–22).

[3] The timing of these changes in control is shown on Fig. 1B of the text against the vacancies series, upon which they had little visible effect.

[4] See *Ministry of Labour Gazette*, Aug. 1948 (p. 260), and Feb. 1949 (pp. 40–41).

(3) Derivation of the Demand Indices

The estimation of each demand index generally fell into two stages:

(i) Where unemployment and vacancies showed a fairly close inverse relation, interpretation depended on the value assigned to the statement ratio. Evidence supplementary to the observed values of unemployment and vacancies generally gave some pointer to the most plausible value.

(ii) Experiments were then made to see whether the remaining observations could best be explained by the assumption of a shift in the extent of maladjustment, or alternatively in the value of the statement ratio. There was again generally some supplementary evidence which pointed to one explanation or the other, though not necessarily very certainly (in such cases the indices are shown on Figs. 4–11 as dotted lines).

The two stages may be illustrated by the data for all industries (Figs. 2 and 4). In years from 1950 on, unemployment and vacancies moved in fairly close inverse relation. In these years, demand appears from these data to have been highest in 1951 and 1955. If, therefore, there was excess demand at any time in the period the statement ratio must have been less than 2.[1] Demand appears to have been lowest in 1952; and if this year is taken (perhaps on the evidence of falling output) as one of deficient demand, the statement ratio must have been more than 0·5.[2] If data for all industries only are looked at, it is possible to fix only rather wide limits for the statement ratio, and to fix them only on the basis of commonsense impressions. The index shown on Fig. 4 assumes that $s \simeq 1$. It is derived not directly from the data for u and v for all-industries, but as a weighted average of the indices for the separate industry groups.

The data for years before 1950 can be explained by supposing either

(i) that the statement ratio fell steeply (from something like 3 to about 1),

or

(ii) that maladjustment fell moderately (from 2·5 to 1·7 by 1950 and 1·5 by 1956—not an unlikely event as post-war dislocations were overcome).

The former assumption implies that the pressure of demand was lower in 1946 and 1947 than any later year except 1952, and (if a value for the statement ratio of about unity is accepted) that there was deficient demand in these years. However much one distrusts commonsense judgements, neither of these suppositions is easily credible; and this alone would justify choice of the second assumption above. This conclusion is, however, also indicated by the data for separate industries for which somewhat better supporting evidence is available.

Evidence regarding the Statement Ratio

It is convenient at this point to give two pieces of evidence regarding the statement ratio. The evidence is indirect, but by the nature of the case direct evidence is unlikely to be forthcoming.

First, the size of the statement ratio can perhaps be deduced by comparing the effect of seasonal variation on the vacancies series with its effect on unemployment. If for instance the ratio were low, one would expect the vacancies series to vary much less than unemployment; and contrariwise if the ratio were high. In fact the amplitude of seasonal variation, being of the same order for each series (Table A1), suggests a statement ratio of unity or rather less. This mode of argument should

[1] In the fourth quarter of 1955 $u = 1·0$, $v = 1·9$. Hence if $d > 0$, $s < 1·9/1·0 = 1·9$ (see Fig. 2).

[2] In the third quarter of 1952, $u = 2·2$, $v = 1·5$. Hence if $d < 0$, $s > 1·5/2·2 = 0·6$ (again see Fig. 2).

strictly, however, be confined to the non-manufacturing industry groups, for only in these was seasonal variation significant. For *Services* the ratio appears as unity and for *Agriculture* and to a less extent *Building* it appears as well under unity.[1]

In interpreting the vacancies data it is important to know not only the average value of s, but also whether it changed over time: this for instance is important in interpreting the all-industries data for years before 1950 (see above). The respective seasonalities of the unemployment and vacancies series were therefore further examined to see if there was any trend in the ratio between them.[2] The fact that in most cases none was found suggests that the statement ratio was fairly stable. The exception is *Agriculture*, where the trend of the relative seasonalities indicated an increase in s over the period. This conclusion is strongly supported by other evidence (see below). The fact that corroboration is available in this case serves to strengthen faith in this whole manner of argument from relative seasonalities, which might otherwise be doubted as too ingenious.

TABLE A1

Statement Ratio as indicated by Seasonalities

Industry group	*Amplitude of seasonal movement**		*Indicated statement ratio†*
	Unemployment	*Vacancies*	
Building . .	0·44	0·27	0·7
Agriculture . .	0·53	0·10	0·2
Services. . .	0·17	0·17	1·0
All industries .	0·14	0·11	..‡

* Average, disregarding sign, of estimated monthly or four-weekly seasonal correction.

† Ratio of the two amplitudes.

‡ Seasonality in manufacturing is too small to allow any conclusion for manufacturing (and hence also for all industries) to be drawn.

Second, we can probably infer something about the way the statement ratio is affected by changes in the strength of demand. We know that in manufacturing industries a declining proportion of jobs becoming vacant are notified to the employment exchanges, and that the proportion may now be as low as a third (Table A2). On the other hand, it seems that all the vacancies remaining unfilled at the end of the reporting period are notified to the exchanges.[3] The explanation probably is that it is the vacancies which are hardest to fill which are left on the official records as unfilled. This would also explain why, though the notification of vacancies was considerably affected by changes in the control of engagements (Table A2), the statement ratio hardly seems to have been affected at all.[4]

If this explanation is correct one might perhaps expect unfilled vacancies to continue to be fully reported even when demand increased and vacancies became

[1] For reasons given later these exact figures were not adopted in later working: for values of s finally adopted see Table 1 of text.

[2] Seasonal correction factors were calculated as average deviations from moving averages. The arithmetic sum of these deviations was calculated for each year, and tested for rank correlation with time. This test was made for the four cases where seasonality was considerable (*All-industries*, *Building*, *Services*, and *Agriculture*). Only in *Agriculture* was there a significant (inverse) correlation with time, indicating an increase in s over the period.

[3] i.e. that the statement ratio is about unity: see discussion of separate industries below.

[4] As shown above in Section (2) of this Appendix.

in a sense still more difficult to fill. This is one reason for disbelieving the supposition that the statement ratio is a decreasing function of demand. If it is not sensitive to demand in this way, then our index is probably a fairly good cardinal index of demand.[1]

TABLE A2

Changes in Statutory Regulations and their Effect on the Use of Employment Exchanges

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
Compulsion to use exchanges* . .	..	Oct. 47 to Mar. 50		..	..	Feb. 52 to Apr. 56				..
Vacancies filled *via* exchanges (1949 = 100):										
Total . . .	62	102	100	66	54	71	69	69	68	52
Manufacturing .	..	..	100	65	50	67	68	71	71	51
Latter as % of total hirings† . .	..	..	*66*	*39*	*30*	*48*	*44*	*43*	*42*	*33*

* For details of statutory regulations see Section (2) above.

† Hirings in manufacturing were estimated from the statistics of labour turnover.

Data for Separate Industry Groups

The unemployment and vacancy statistics were interpreted separately for the seven major industry groups.[2] With one exception, the data for each of the separate industries (Figs. 5–11) display the main features already stressed. Towards the end of the period, the observed values of unemployment and vacancies can be interpreted as lying on one curve, convex to the origin. For earlier years, however, the points lie upwards and to the right. Here again, therefore, it must be supposed there was a shift either in maladjustment or in the statement ratio. In each case, also, the shift appears gradual and continuous; and in each case falling maladjustment appears the likely explanation. The exception is *Agriculture* (see below).

In the process of selecting between various interpretations of the unemployment and vacancy data, regard was also paid to changes in employment and in hours worked in each industrial group. A marked and rapid increase in employment or hours was taken as a probable indication of high demand. A fall in hours was taken as probably indicative of low demand; but the interpretation of a fall in employment, unless accompanied by a fall in output, appeared less clear-cut. During the period studied it was rare for an industry to show a fall in employment, and where small falls occurred this may sometimes have been due to high demand elsewhere, rather than low demand in the industry in question. Contemporary impressions of

[1] Cf. discussion in Section 2 of the text.

[2] The seven major industrial groups are defined as in Table 1 of the text. The large group, *Services*, was further subdivided into Distributive Trades, Transport and Communication, and Other Services. Since results for each of the sub-groups closely resemble those for the group as a whole, the detail has not been shown separately.

Data for 1946 were not available for separate industrial groups. Interpretation was originally based on the data for 1947–55: subsequently the same interpretation was extended without modification to take in 1956. For explanation of the scales on Figs. 5–11 see comment on Fig. 4 in Section 2 of text.

labour shortage, if called in evidence, were treated with some caution.[1] The possibility of using changes in the rate of labour turnover as evidence was considered, but rejected.[2] Nor was any attempt made to use the rate of wage change as evidence.[3]

Metals (Fig. 5). Interpretation is fairly straightforward for years after 1951 or 1952 (u then mirrors v fairly well). The trend of employment is steadily upward till 1953 when there was a slight fall (hours were steady in 1952 and 1953 but otherwise rising). This is taken to indicate that demand was not excessive in 1953. Given the observed values of u and v this implies that s must have been in the neighbourhood of 1·3; and that v is the more sensitive indicator except for 1953 itself.

Prior to 1951 or 1952 the evidence of u and v diverges. The more 'inflationary' hypothesis is adopted (constant statement ratio and changing maladjustment). The alternative would be to take the high values of unemployment to reflect low demand in the first years, and to suppose that high vacancies arose merely through gross overstatement of demand. This interpretation seems incompatible with the rise in employment (rapid in 1946 and slower thereafter).

Textiles (Fig. 6). The evidence is fairly straightforward for 1951 on (u and v mirror each other: 1952 shows the greater sensitivity of u). The marked fall in employment in 1955 is taken to indicate approximate zero excess demand, which given the observed values of u and v fixes s at about 2, and suggests that v is slightly the more sensitive indicator except during the depression years 1952–3.

For years prior to 1951, the 'shifting maladjustment' interpretation results in a gradually falling index of demand. This seems more consistent with the general development of the industry, and in particular the rapid rise in employment, than the alternative interpretation. (If we supposed the high vacancies were purely due to gross over-statement we would show deficient demand in these years.)

Other Manufacturing (Fig. 7). Years 1951 on are fairly straightforward. The dip in hours and output (with stability of employment) in 1952 is taken to indicate a slightly deficient demand in that year. This suggests that the value of s is about 0·8; and that (for years other than 1952) v is the more sensitive indicator.

Prior to 1951 the case is similar to *Textiles*. The rapid rise in employment suggests high falling demand (as shown by the shifting-m interpretation) rather than low rising demand (as shown by the shifting-s interpretation).

Mining (Fig. 8). In this case u and v display the simple inverse relation from 1949 on. From the trend of the curves, v appears markedly more 'sensitive' in years 1949–53; while in 1954–5 u and v appear equally so. Given the run of the figures this implies a value for s of about unity.[4]

For years 1947–8, the marked rise in employment is taken to indicate effectively high demand; and thus (as in cases above) to point to the shifting-m interpretation.

[1] Contemporary comment, official or journalistic, about labour requirements was often based on the requirements of 'the national interest' rather than on the demand by different industries actually effective in the labour market, which is the interest here.

[2] It is often supposed that high labour turnover is encouraged by a high demand for labour; and Professor Lundberg has suggested that the turnover rate is a useful indicator of the latter (see his contribution, pp. 69–70, to *The Business Cycle in the Post-War World*, edited by him for the International Economic Association, London, Macmillan, 1955). The rates of engagement and discharge in our three manufacturing groups were therefore examined. It seems quite possible that the rate of *voluntary 'quits'* would show an inverse relation to the strength of demand, if this (as in American figures) were separately distinguished. In fact only one figure of 'discharges' is shown, which includes discharges made on the initiative of employers. Now employers' discharges may well rise when demand falls off and so mask any fall in voluntary quits. It is probably for this reason that there was no perceptible relation between the rate of discharge and other indicators of labour demand.

[3] At a later stage of work it is intended to test whether labour demand (estimated as here independently) helps to explain wage changes.

[4] The fall in employment in 1954 and 1955 is taken here to indicate not low demand for labour in *Mining* but the superior attractiveness of other industries.

Building (Fig. 9). From 1950 on the movements of u and v tally fairly well and there seems little to choose between them on grounds of sensitivity. In peak years (1951 and 1955) v has therefore been used; in others, u. This is perhaps supported by the fall in hours in 1952, which would indicate lack of demand and hence a preference for taking u to be more sensitive.[1] This interpretation implies that $s \simeq 0{\cdot}9$.

Only in 1947 do different interpretations give very different results. The shifting-m interpretation gives a much higher demand index, which seems the most plausible view in the light of the enormous expansion in employment in this industry between 1945 and 1947.

Agriculture (Fig. 10) is exceptional in that the showing of u and v is conflicting only *after* 1951, and thereafter gets *more* conflicting as time goes on.

Taking the years before 1951, v appears more sensitive in 1947, and u more sensitive in 1949–51. This suggests approximate balance in the labour market, and thus (given the low value of v relative to u) a very low value for the *statement ratio* (perhaps 0·4).

After 1951 it is more plausible to suppose that s rather than m increased,[2] and there is an explanation ready to hand. In 1952 extended deferment was granted to agricultural workers from National Service call-up, provided that evidence could be shown that 'the farmer had unsuccessfully made genuine efforts to find alternative labour'.[3] Unsuccessful notification of vacancies was doubtless taken as evidence of such efforts. This interpretation permits a plausible estimate (shown as dotted curve) for demand.

Services (Fig. 11). The index for this group is perhaps less firmly based than for any of the other groups; and *Services* is a large group, accounting for almost half of employees. Throughout the period u and v mirrored each other fairly well, so that there are no fundamental difficulties of interpretation. Of the two, v appears in most years the more sensitive indicator. This suggests that demand tended to be excessive, and (given the observed values) that $s \simeq 0{\cdot}6$.[4] There are no obvious grounds[5] for choosing between the shifting-m and shifting-s interpretations in order to account for the slight 'divergence' that is apparent. Since the former appears generally to have applied, it is adopted here. Compared with the alternative hypothesis this gives higher values for the demand index in the early years, which seems plausible.

The demand index for *all industries* (Fig. 4) was obtained as the weighted average of the indices for separate industry groups.[6] This should be more reliable than an index based only on the total unemployment and vacancy figures, not only because there is additional information, but also because errors may offset each other. The quarterly indices of demand shown in Figs. 4–11 are given in full in Table A3.

[1] It is impossible to believe that the fall in employment in 1951 reflects low demand in *Building* so much as high demand elsewhere.

[2] Some evidence that s increased in *Agriculture* has already been cited.

[3] Ministry of Labour and National Service, *Annual Report* for 1952, p. 12.

[4] This is lower than suggested in Table A1 above.

[5] The evidence of employment is indecisive. It increased slowly except in 1951: here again this dip must be due rather to high demand elsewhere than to low demand in Services.

[6] Except for 1946 which was extrapolated by use of over-all data for u and v, s being assumed to be as in 1947.

TABLE A3

Quarterly Data for Great Britain and seven Major Industry Groups, 1946 *or* 1947–1956

Unemployment (u), Unfilled Vacancies (v), and Calculated Index of Demand (d)
(all expressed as percentages of number of employees, quarterly series being seasonally corrected)

Industry group	*Year*	*1st quarter*			*2nd quarter*			*3rd quarter*			*4th quarter*			*Annual averages*		
		u	v	d	u	v	d	u	v	d	u	v	d	u	v	d
Metals, engineering, and vehicles	1947	(2·10)	2·72	−0·01	2·04	2·71	0·02	1·43	2·78	0·39	1·40	2·70	0·37	(1·78)	2·73	0·19
	1948	1·56	2·51	0·20	1·61	2·24	0·06	1·53	2·07	0·03	1·47	1·83	−0·03	1·54	2·16	0·07
	1949	1·52	1·81	−0·07	1·38	1·84	0·02	1·18	1·88	0·14	1·29	1·73	0·02	1·34	1·81	0·03
	1950	1·34	1·73	−0·01	1·22	1·84	0·10	1·10	1·97	0·22	1·05	1·93	0·24	1·18	1·87	0·14
	1951	0·99	2·10	0·35	0·79	2·64	0·77	0·71	2·76	0·90	0·81	2·27	0·56	0·83	2·44	0·65
	1952	1·03	1·85	0·21	1·12	1·79	0·14	1·19	1·54	0	1·32	1·25	−0·19	1·17	1·61	0·04
	1953	1·69	1·17	−0·46	1·46	1·27	−0·27	1·09	1·39	−0·01	1·07	1·31	−0·03	1·33	1·29	−0·19
	1954	1·17	1·30	−0·09	0·97	1·53	0·11	0·76	1·71	0·32	0·80	1·64	0·26	0·92	1·54	0·15
	1955	0·75	1·70	0·32	0·64	1·93	0·51	0·54	2·08	0·67	0·57	1·83	0·51	0·63	1·88	0·50
	1956	0·71	1·71	0·35	0·86	1·62	0·21	1·24	1·55	−0·02	0·95	1·25	0·01	0·94	1·53	0·14
Textiles, leather, and clothing	1947	(1·03)	7·55	1·80	1·25	7·20	1·48	0·76	7·52	2·07	0·75	7·68	2·14	(0·96)	7·48	1·87
	1948	0·80	7·07	1·85	0·92	6·35	1·47	0·92	6·13	1·39	0·86	5·64	1·26	0·87	6·30	1·49
	1949	0·88	5·18	1·08	0·75	5·18	1·20	0·69	5·13	1·24	0·83	4·87	1·01	0·79	5·09	1·13
	1950	0·81	4·69	0·97	0·91	4·46	0·81	0·93	4·17	0·69	0·70	4·07	0·84	0·84	4·35	0·83
	1951	0·67	3·97	0·83	0·61	4·01	0·90	0·82	3·57	0·58	2·42	2·30	−0·75	1·13	3·46	0·39
	1952	5·44	2·00	−3·11	9·83	1·83	−6·83	5·95	2·01	−3·51	2·83	2·49	−0·95	6·01	2·08	−3·60
	1953	1·87	2·71	−0·28	1·34	2·91	0·06	1·08	3·04	0·24	1·10	2·92	0·19	1·35	2·90	0·05
	1954	1·19	2·79	0·11	1·07	2·86	0·19	0·99	2·85	0·24	0·97	2·80	0·24	1·05	2·83	0·20
	1955	1·18	2·90	0·14	1·60	2·99	−0·05	1·53	3·05	0	1·06	3·14	0·28	1·34	3·02	0·08
	1956	1·15	3·17	0·24	1·44	3·05	0·04	1·28	2·96	0·10	1·06	1·75	−0·10	1·23	2·98	0·07

Industry group	Year	1st quarter			2nd quarter			3rd quarter			4th quarter			Annual averages		
		u	*v*	*d*	*u*	*v*	*d*	*u*	*v*	*d*	*u*	*v*	*d*	*u*	*v*	*d*
Other manufacturing . .	1947	(2·00)	2·69	0·77	1·92	2·81	0·92	1·29	3·03	1·58	1·26	2·84	1·44	(1·62)	2·85	1·18
	1948	1·38	2·57	1·11	1·37	2·35	0·93	1·29	2·19	0·86	1·35	1·86	0·55	1·35	2·24	0·86
	1949	1·47	1·82	0·45	1·30	2·03	0·72	1·05	2·06	0·93	1·22	1·72	0·53	1·26	1·91	0·66
	1950	1·42	1·62	0·33	1·33	1·73	0·47	1·21	1·73	0·55	1·17	1·61	0·48	1·28	1·67	0·46
	1951	1·14	1·79	0·64	0·85	2·23	1·25	0·82	2·08	1·14	1·15	1·47	0·39	0·99	1·89	0·86
	1952	1·55	1·15	−0·06	1·81	1·10	−0·23	1·73	1·00	−0·26	1·75	0·89	−0·36	1·71	1·03	−0·23
	1953	1·93	0·95	−0·42	1·54	1·22	−0·01	1·24	1·36	0·25	1·28	1·22	0·13	1·50	1·19	−0·01
	1954	1·56	1·11	−0·09	1·22	1·45	0·33	0·94	1·61	0·64	0·99	1·45	0·47	1·18	1·41	0·34
	1955	1·17	1·45	0·36	1·16	1·78	0·62	0·75	1·91	1·05	0·83	1·56	0·68	0·98	1·67	0·68
	1956	1·22	1·37	0·27	1·08	1·44	0·41	0·95	1·42	0·48	1·05	1·09	0·17	1·08	1·33	0·33
Mining and quarrying and public utilities	1947	(1·10)	1·75	0·36	0·61	1·71	0·69	0·43	1·66	0·82	0·40	1·84	0·98	(0·63)	1·74	0·71
	1948	0·40	1·61	0·81	0·43	1·34	0·58	0·41	1·06	0·40	0·40	0·85	0·27	0·41	1·21	0·52
	1949	0·37	0·80	0·26	0·37	0·76	0·23	0·37	0·82	0·27	0·42	0·80	0·22	0·38	0·79	0·25
	1950	0·40	0·78	0·22	0·39	0·86	0·28	0·42	0·91	0·29	0·42	1·07	0·40	0·41	0·90	0·30
	1951	0·36	1·24	0·57	0·33	1·20	0·57	0·31	1·22	0·61	0·30	1·17	0·58	0·33	1·20	0·58
	1952	0·32	0·93	0·38	0·36	0·80	0·26	0·40	0·69	0·17	0·42	0·61	0·10	0·38	0·76	0·23
	1953	0·43	0·55	0·06	0·42	0·52	0·05	0·39	0·57	0·10	0·38	0·59	0·12	0·41	0·56	0·08
	1954	0·41	0·59	0·10	0·37	0·63	0·15	0·35	0·64	0·17	0·31	0·68	0·22	0·36	0·63	0·16
	1955	0·29	0·75	0·28	0·27	0·77	0·31	0·26	0·82	0·36	0·25	0·82	0·37	0·27	0·79	0·33
	1956	0·29	0·81	0·33	0·27	0·73	0·29	0·27	0·68	0·25	0·32	0·59	0·16	0·29	0·70	0·26
Building and contracting . .	1947	(2·40)	5·59	2·35	2·29	6·78	3·38	2·26	6·92	3·52	2·04	5·68	2·72	(2·25)	6·33	2·98
	1948	1·85	4·09	1·65	2·62	3·31	0·57	3·15	3·25	0·24	2·95	2·94	0·16	2·64	3·40	0·66
	1949	2·83	2·94	0·23	3·01	2·97	0·15	2·84	3·18	0·37	2·92	3·05	0·24	2·90	3·04	0·25
	1950	2·70	2·90	0·27	2·98	2·32	−0·21	2·89	2·25	−0·20	2·74	2·46	0	2·83	2·48	0·30
	1951	2·25	3·02	0·61	2·00	3·03	0·77	1·93	2·95	0·76	2·02	2·67	0·52	2·05	2·92	0·58
	1952	2·37	2·24	0·06	2·71	2·03	−0·24	2·86	1·88	−0·42	3·37	1·80	−0·77	2·83	1·99	0·23
	1953	2·99	1·90	−0·48	2·92	1·61	−0·64	2·78	1·61	−0·55	2·75	1·80	−0·41	2·86	1·73	0·08
	1954	3·07	1·73	−0·64	2·52	1·90	−0·21	2·30	1·99	− 0·05	2·09	2·09	0·12	2·50	1·93	0·16
	1955	1·72	2·31	0·47	1·79	2·47	0·53	1·83	2·37	0·44	1·71	2·27	0·45	1·76	2·36	0·33
	1956	1·80	2·06	0·26	1·91	1·75	0·02	2·15	1·48	−0·27	2·19	1·42	−0·33	2·01	1·68	0·08

Agriculture, forestry, and fishing	1947	(1·08)	0·73	0·21	1·12	1·23	1·57	1·26	1·19	1·18	1·21	1·23	1·31	(1·18)	1·14	1·08
	1948	1·22	0·98	1·28	1·08	0·82	1·70	1·59	0·64	0·52	1·55	0·55	0·58	1·36	0·75	1·02
	1949	2·11	0·51	−0·11	1·81	0·39	0·21	1·78	0·35	0·25	1·99	0·39	0·01	1·92	0·41	0·09
	1950	2·53	0·42	−0·53	2·14	0·41	−0·14	1·93	0·41	0·07	2·06	0·46	−0·06	2·16	0·43	−0·17
	1951	1·71	0·53	0·34	1·70	0·55	0·35	1·60	0·58	0·50	1·54	0·65	0·60	1·63	0·58	0·45
	1952	1·40	0·72	0·86	1·66	0·94	0·41	1·87	0·91	0·14	2·00	0·91	0	1·73	0·87	0·35
	1953	1·66	1·06	0·41	1·88	1·15	0·13	1·87	1·29	0·14	1·79	1·41	0·24	1·80	1·22	0·23
	1954	1·75	1·53	0·29	1·86	1·82	0·15	1·78	2·03	0·25	1·57	2·23	0·55	1·74	1·90	0·31
	1955	1·41	2·40	0·84	1·54	2·61	0·60	1·57	2·82	0·55	1·46	2·84	0·74	1·50	2·66	0·68
	1956	1·37	3·03	0·92	1·66	3·12	0·41	1·88	3·27	0·19	1·62	3·51	0·47	1·62	3·23	0·50
Services	1947	(1·81)	1·87	0·74	1·87	1·77	0·60	1·51	1·87	0·95	1·38	1·92	1·10	(1·64)	1·87	0·85
	1948	1·43	1·98	1·13	1·60	1·79	0·80	1·74	1·71	0·62	1·74	1·61	0·52	1·62	1·77	0·77
	1949	1·72	1·65	0·58	1·74	1·59	0·50	1·66	1·56	0·52	1·76	1·47	0·37	1·72	1·57	0·49
	1950	1·83	1·46	0·32	1·83	1·31	0·19	1·81	1·32	0·21	1·72	1·45	0·38	1·80	1·38	0·28
	1951	1·56	1·60	0·63	1·41	1·74	0·88	1·41	1·76	0·90	1·46	1·53	0·62	1·46	1·66	0·76
	1952	1·64	1·34	0·32	1·83	1·23	0·11	1·95	1·11	−0·05	2·02	1·07	−0·12	1·86	1·19	0·07
	1953	1·98	1·11	−0·07	1·88	1·11	−0·02	1·81	1·17	0·07	1·76	1·25	0·17	1·86	1·16	0·04
	1954	1·74	1·26	0·19	1·66	1·34	0·31	1·52	1·48	0·53	1·42	1·59	0·71	1·58	1·42	0·44
	1955	1·35	1·67	0·85	1·30	1·80	1·03	1·26	1·93	1·20	1·18	1·87	1·20	1·27	1·82	1·07
	1956	1·16	1·77	1·10	1·26	1·62	0·86	1·40	1·58	0·71	1·38	1·46	0·60	1·30	1·61	0·82
Total: All industries . .	1946	1·58	3·51	1·43	1·94	3·15	0·89	2·01	3·07	0·77	1·83	3·00	0·80	1·84	3·18	0·97
	1947	(1·80)	2·80	0·75	1·76	2·80	0·80	1·42	2·90	1·16	1·32	2·90	1·18	(1·58)	2·86	0·97
	1948	1·33	2·66	1·02	1·47	2·33	0·73	1·62	2·18	0·55	1·58	2·02	0·44	1·50	2·30	0·68
	1949	1·56	2·00	0·41	1·51	1·97	0·44	1·45	1·96	0·52	1·55	1·88	0·34	1·52	1·95	0·42
	1950	1·56	1·84	0·27	1·55	1·72	0·22	1·55	1·71	0·27	1·45	1·81	0·36	1·53	1·77	0·27
	1951	1·26	1·98	0·57	1·11	2·17	0·86	1·16	2·12	0·86	1·36	1·78	0·46	1·19	2·01	0·69
	1952	1·72	1·50	−0·01	2·25	1·37	−0·48	2·08	1·24	−0·34	1·91	1·23	−0·25	1·99	1·34	−0·27
	1953	1·83	1·27	−0·20	1·67	1·28	−0·09	1·55	1·36	0·06	1·50	1·42	0·09	1·64	1·33	−0·04
	1954	1·53	1·40	0·04	1·38	1·51	0·22	1·28	1·63	0·41	1·20	1·70	0·48	1·34	1·56	0·29
	1955	1·11	1·78	0·57	1·13	1·91	0·70	1·09	2·01	0·86	1·00	1·94	0·81	1·08	1·91	0·73
	1956	1·03	1·84	0·68	1·14	1·69	0·51	1·34	1·62	0·38	1·23	1·50	0·29	1·19	1·66	0·46

THE EISENHOWER ADMINISTRATION AND THE RECESSION, 1953–5

By A. E. HOLMANS

1. Scope and Purpose

THE recession of 1953–5 is interesting and important for two reasons: firstly it is in a sense a case study of a recession and the Government's action and inaction to meet it; and secondly, because it took place under a Republican administration, it affords an opportunity to see whether there are major differences between the Republican and Democratic parties as to the role the Government should play in maintaining full employment or, if the exact wording of the Employment Act is preferred, 'maximum employment, production, and purchasing power'. In many respects the onset of a recession was the acid test of the impact of modern, or, if you prefer it, Keynesian, ideas about countercyclical policy on Republican thinking in the United States. All of this new body of ideas on countercyclical policy had grown up while the Republican Party was in opposition, so that in so far as it had been employed in the United States it had been employed by Democratic administrations. In particular, the recommendations that in time of falling employment the Government should run a deficit and that expenditures for public works should be increased had been practised by the Roosevelt administration and hence were extremely suspect. It became standard Republican practice to denounce deficit financing and public works as unsound and dangerous, as inflationary and inimical to private enterprise; the balanced budget was regarded as sacrosanct, whatever the state of the economy. That this was the attitude that prevailed among many leading Republicans when the Eisenhower administration took office is hardly in doubt: take for instance the manner in which the aim of stopping the alleged depreciation of the currency was expressed by Eisenhower in his Tax Message in May 1953,[1] by Secretary Humphrey in his address to the Associated Press luncheon on 20 April 1953,[2] and, at a later date, his speech to the Investment Bankers' Association.[3] If this sort of pronouncement, suggesting that the Republicans had

[1] Printed in *Annual Report of the Secretary of the Treasury for the fiscal year 1953*, pp. 204–7: 'I want ... to stop the deterioration of the currency which has been going on for so many years under the unsound fiscal and monetary policies of the past administration' (p. 205).

[2] Text of speech printed in *Annual Report of the Secretary of the Treasury for the fiscal year 1953*, pp. 239–42: 'For many years we have been treading a dangerous path, one from which we have now turned. It is not too late to make the turn from the inevitable disaster for which we were directly headed. For twenty years we have been consistently following unhealthy policies which induced inflation, depreciated our currency, and threatened to exhaust our credit.'

[3] 21 Oct. 1954, text printed in the *Annual Report of the Secretary of the Treasury for the fiscal year 1955*, pp. 271–4.

learnt nothing about economic policy in the twenty years since President Hoover left office, was a guide to the policies the Eisenhower administration would pursue, it augured ill for the world as a whole and for the United States as well. It will be the purpose of this paper to examine to what extent this impression was falsified during the next two and a half years.

2. From the Inauguration to the Onset of the Recession

When the Eisenhower administration took office, the Federal Reserve System was pursuing a restrictive credit policy, a policy which the administration approved and reinforced. National Debt policy was used to reinforce the tight money policy, and steps were taken to reduce government expenditure while opposing any tax cuts. Clearly the administration believed a serious danger of inflation existed. The policy of higher interest rates was very controversial at the time and has remained so ever since. The official view was that pressure of demand was increasing in all sectors of the economy at a time when there were no unemployed resources, so that unless the demands were moderated, serious inflationary pressure would make itself felt.[1]

On the other hand, there was strong criticism from leading Democrats at the time and subsequently, both on the ground that the danger of inflation was remote, with the implication that the restrictive policy would lead to reduced economic activity,[2] and that the higher interest rates were an unnecessary burden on the taxpayer for the benefit of banks. There was even a demand that the Federal Reserve System should be required to support U.S. Government bonds at par once more.[3] That the tight money policy was unnecessary or at any rate carried to undesirable lengths is a view expressed by many economists and one which is probably justified. At the end of April the new 3¼ per cent. bonds fell below par and the bond market was in turmoil; but during May the policy of the Federal Reserve System was changed abruptly; it made net purchases of securities of $900 million in less than a month and in June reserve requirements were reduced

[1] For instance, Secretary Humphrey to the Economic Stabilization Subcommittee of the Joint Committee on the Economic Report, 6 Dec. 1954, published hearings, p. 213; and William McC. Martin, Chairman of the Board of Governors of the Federal Reserve System, to subcommittee, printed in hearings, pp. 3 and 7–8.

[2] For instance, Senator Douglas in statement in the Senate, 3 August 1953 (*Congressional Record*, vol. xcix, pp. 11027–9 (all references to the *Congressional Record* are to the permanent bound edition); the Democratic members of the Joint Committee on the Economic Report in the Joint Economic Report, 1954.

[3] Representative Patman introduced a resolution to this effect on 11 May 1953 (H. Con. Res. 98, 83rd Congress, 1st Session), which stated *inter alia* that the high rates of interest then prevailing caused an unnecessary burden on the taxpayer. For a very extreme attack on the conduct of monetary policy, with special reference to 1953 but with other occasions unfavourably mentioned, see Patman's individual statement of views in the *Report of the Joint Committee on the Economic Report*, 1954.

by two percentage points for central reserve city banks and by one percentage point for other banks. This rapid reversal lends support to the view that the tight money policy was abandoned because it was a mistake and had been a mistake all along, for which the preconceived views of the incoming administration were in part responsible, at any rate for the vigour with which the policy was pursued in the first four months of 1953. There is little to suggest that economic conditions changed sharply in May 1953, that inflationary pressures hitherto threatening suddenly evaporated. We may agree with Professor Samuelson[1] that the Federal Reserve System was not so clairvoyant that in May it could foresee the onset of the recession in the autumn. The probability of reductions in defence expenditure later in the year might have influenced the Federal Reserve, but there is no suggestion of this in their statements at the time.

But to assert that the Eisenhower administration must bear a large share of the responsibility for the recession because of unwise monetary policy is quite another matter. It would seem that there were two main causes of the recession: the rapid reduction in defence expenditure and the swing from inventory accumulation in the first three quarters of 1953 to liquidation in the fourth quarter. The following table shows the quarterly changes of business inventories in 1953:

TABLE I

$ billion, seasonally adjusted annual rates

1953	1st quarter	+2·2
	2nd „	+4·5
	3rd „	+2·0
	4th „	−4·0

Source. Economic Report of the President, 1956, Table D–7.

The cause of the increase in inventories, at any rate after they had been restored to the level existing before the 1952 steel strike, was what the Council of Economic Advisers described as an imbalance between income and demand for goods. Disposable income rose, but most of the increase was either spent on services or saved.

Coinciding with the change from inventory accumulation to inventory liquidation was a large and rapid reduction in expenditure on defence. President Eisenhower cut the estimate of defence expenditure in the fiscal year 1954 from the $57·3 billion in the budget submitted by President Truman to $54·0 billion, and further reductions were made after the sign-

[1] In 'The Economics of Eisenhower', symposium in the *Review of Economics and Statistics*, Nov. 1956.

ing of the truce in Korea in July 1953. The following table shows the estimated effect of the reduction of defence expenditure:

TABLE II

	Expenditure on defence programmes (*$ billion, annual rate*)	*Defence purchases of durable goods* (*$ billion, annual rate*)
1953 2nd quarter	54	28
1954 2nd „	44½	20

Source. Department of Commerce, Survey of Current Business, Sept. 1954, pp. 7–8.

A swing of this magnitude was certain to give rise to serious problems of readjustment.

One of the most important questions about the cause of the recession is whether the change from inventory accumulation to liquidation was the result of the reduction in defence expenditure, that is to say, whether the recession could be attributed entirely to the reduction in defence expenditure. This point was put to the Chairman of the Council of Economic Advisers, Dr. Burns, by Representative Bolling in the course of the hearings on the 1955 Economic Report. In reply Dr. Burns pointed out that between the second and fourth quarters of 1953 there was a swing of $9·6 billion in inventory investment[1] whereas the decline in defence expenditure in this period was at an annual rate of $3·7 billion, so that initially the change in inventory investment was a more potent force than the direct effect of the reduction in defence expenditure. On the question of whether the reduction in defence expenditure had been the cause of the change in inventory policy, he held the change was due to the 'imbalance' which had led to the accumulation of inventories, in that it had led firms to reduce their purchases in order to bring their inventories into better balance with their sales. He agreed, however, that the reduction of new defence orders was also effective in reducing inventory requirements.[2]

It would seem to follow from this that the tight money policy was not a major factor in causing the recession. It clearly had no effect whatever on the level of defence expenditure; and it seems very unlikely that it caused the change from inventory accumulation to inventory liquidation, since this did not occur till four or five months after the tight money policy had been reversed. Discussing this point with Senator Douglas before the Economic Stabilization Subcommittee, the most that Secretary Humphrey would claim was that but for the tight money policy the accumulation

[1] This estimate was subsequently revised, hence it differs from the data in Table I *supra*

[2] *Joint Committee on the Economic Report,* hearings, 24 Jan. 1955, pp. 46–48.

would have been greater than it otherwise was and the liquidation correspondingly more severe.[1] Nor does it appear that the tight money policy was the cause of the 'imbalance' between income and purchases of goods that apparently caused the accumulation, since the amount of consumer credit outstanding rose steadily throughout the tight money period and only began to fall off at the end of the year when the rise in personal incomes came to a halt. Since it does not seem plausible to attribute either the inventory accumulation or the change to inventory liquidation to credit policy, it would seem that the Eisenhower administration must be acquitted of the charge of having brought on the recession by mistaken credit policies.

3. The Recession and Policies to Counteract it

First of all, it may be useful to give a few details to indicate the nature and magnitude of the recession:

TABLE III

	G.N.P. (*$ billion, annual rates*)	*Industrial production*	*Production of durable goods*	*Unemployment* (*millions*)
1953 Peak	369·3 (Second quarter)	137 (July)	157 (August)	1·3 (October)
1954 Trough	357·6 (Second quarter)	123 (March)	134 (April)	3·7 (March)

Source. Industrial Production and Output of Durable Goods, Federal Reserve seasonally corrected indices, 1947–9 = 100; unemployment figures from Bureau of the Census new series based on sample surveys in 230 areas. G.N.P.: *Economic Report of the President, 1956*, Table D–1.

TABLE IV

Changes in Employment by Industry Group, Second Quarter 1953 to Second Quarter 1954

Industry group	*Change %*
Ordnance and accessories	−36
Primary metals	−13
Electrical machinery	−13
Transportation equipment	−12
Non-electric machinery	−10
All durable manufactures	−11
Mining	−10
Textiles	−12
Wholesale and retail trade	negligible
Service and miscellaneous	+2

Source. Tables I and II in Kramer, 'A Review of Employment Trends in 1954 and 1955', *Monthly Labor Review*, vol. lxxviii, pp. 1105–11.

[1] Hearings, 6 Dec. 1954, p. 213.

TABLE V

Changes in the Components of the G.N.P.

	Change from second quarter 1953 to			
	1953 (Fourth quarter)	*1954 (Second quarter)*	*1954 (Fourth quarter)*	*1955 (Second quarter)*
Personal consumption .	−1·1	+3·7	+9·6	+19·1
Non-farm housing . .	−0·5	+0·8	+2·0	+4·7
Other private domestic investment in fixed capital	−0·2	−2·7	−1·2	+0·6
Inventory accumulation .	−8·5	−7·2	−5·1	−0·2
Net foreign investment .	+1·3	+2·2	+3·4	+1·8
Government purchases of goods and services:				
National security .	−3·8	−9·6	−12·7	−12·8
Other . . .	+3·2	+1·1	+1·8	+2·3
Gross national product .	−9·4	−11·7	−2·2	+15·5

Changes expressed in $ billion, seasonally adjusted annual rates; detail will not necessarily add to totals because of rounding.

Source. Economic Report of the President, 1956, Table D–1.

TABLE VI

Changes in the Composition and Disposal of Personal Income

	Change from third quarter 1953 to		
	1954 (Second quarter)	*1954 (Fourth quarter)*	*1955 (Second quarter)*
I. Personal income before tax and transfer:			
Labour income . . .	−4·9	−2·2	+6·4
Farmers	+0·2	−0·5	−0·7
Business and professional .	+0·2	+0·6	+1·4
Rent, dividends, interest .	+1·1	+2·3	+2·9
Total personal income . .	−3·4	−0·2	+10·0
Personal tax liability . .	−3·4	−3·0	−2·7
Transfers (net) . . .	+1·9	+2·5	+2·4
II. Total disposable income .	+2·0	+5·9	+15·2
Consumption . . .	+3·0	+8·9	+18·4
Saving	−1·1	−3·1	−3·3

Change in $ billion, seasonally adjusted annual rates; detail will not necessarily add to totals because of rounding.

Source. Economic Report of the President, 1956, Tables D–11 and D–12.

TABLE VII

Sources and Uses of Gross Saving

	Private saving		*Government*		*Gross private domestic investment*	*Net foreign investment and statistical discrepancy*
	Personal	*Business*	*Federal*	*Other*		
1953 1st quarter	18·7	35·1	−3·7	−0·7	51·7	−2·3
2nd „	19·6	35·7	−5·7	1·0	55·0	−4·4
3rd „	19·9	33·4	−5·1	0·6	52·8	−4·1
4th „	21·1	33·3	−10·3	−0·3	46·0	−2·1
1954 1st „	21·0	35·6	−11·0	−1·0	45·5	−1·0
2nd „	18·8	36·8	−5·8	−1·0	46·9	2·0
3rd „	16·6	36·6	−5·7	−1·0	45·9	0·8
4th „	16·8	37·7	−2·3	−1·3	50·7	0·2
1955 1st „	15·3	40·2	−0·5	−1·9	54·1	−1·1
2nd „	16·6	42·2	2·6	−1·8	60·1	−0·5

Totals in $ billion, seasonally adjusted annual rates. It should be noted that the figure for the Federal deficit is obtained by estimating revenues as liability to tax accrues rather than when the tax is paid; for this reason the figures in the above table are not comparable with either the 'conventional' Budget or the cash Budget.

Detail will not necessarily add to totals because of rounding.

Source. Economic Report of the President, 1956, Table D–15.

The recession thus amounted to a drop of about 10 per cent. in industrial production, being concentrated on the durable goods industries, mining, and textiles.

By the end of 1953 it was clear that the Eisenhower administration had to face a recession, whether or not one called it a rolling readjustment or said that the nation was coming down from an overtime economy. Indeed, there is some evidence that for a time the administration had been considering what should be done if the decline in defence expenditure should set up deflationary tendencies, a prospect that President Truman's Council of Economic Advisers had discussed in their 1953 Report. On 9 July 1953 the Bureau of the Budget issued the following directive: 'Increased emphasis will be given to the development of plans for authorized high priority projects to a stage where these projects would qualify for construction at a time when construction starts would be consistent with a less restrictive budget policy.'[1]

The language could scarcely be more guarded than this, but it does suggest that the administration wanted to have plans ready for an increase in public works should the reduction of defence expenditure lead to a deflation that made this desirable. That a Republican administration should be thinking on these lines less than six months after taking office

[1] Quoted in *Economic Report of the President, 1954,* p. 54; this directive resulted in the inclusion in the budget for the fiscal year 1955 of 26 projects with an estimated total cost of $184 million, of which $25 million would be spent in 1955 (*Joint Committee on the Economic Report,* hearings 1 Feb. 1954, pp. 28–29).

is surely significant. In the latter months of 1953 a change in emphasis could be discerned in speeches by members of the administration; there was less talk about putting an immediate end to the inflation that in their earlier speeches they had alleged to be rampant, and more on bolstering confidence about the transition from heavy defence spending to a more normal peacetime economy.[1] In January 1954 it was quite clear that the immediate outlook was for deflation rather than inflation, and it was to this that President Eisenhower addressed himself in his annual Messages to Congress. In the message transmitting the Economic Report of 1954, the President said:

> The arsenal of weapons at the disposal of the government is formidable. It includes credit controls administered by the Federal Reserve System; the debt management policies of the Treasury; the authority of the President to vary the terms of mortgages carrying Federal insurance; flexibility in the administration of the budget; agricultural supports; modification of the tax structure; and public works. We shall not hesitate to use any or all of these weapons as the situation may require.[2]

As a statement of intentions this is vigorous enough and one could hardly expect more from any administration. The next part of the paper will consider how and to what extent these good intentions were carried out.

3. (*a*) Monetary Policy

After the tight money policy had been abandoned, the Federal Reserve System pursued a credit policy that became more and more liberal. The rediscount rate was reduced in February 1954 and reserve requirements, which had already been reduced in June 1953, were reduced again in June and August 1954. Open market purchases were made on a large scale, so that banks had ample reserves; their free reserves fell below $500 million in only two months out of twelve in 1954. This policy of 'active ease'[3] made credit conditions as easy as it was possible to make them; the rate of interest on Treasury Bills was only 0·64 per cent. in June 1954 as against 2·11 per cent. in June 1953; and over the same period the rate on prime commercial paper fell from 2·68 per cent. to 1·56 per cent. Treasury debt management policies played their part in this easy money policy; there were no more issues of long-term loans in 1953 and 1954, and the Secretary of the Treasury claimed that debt management policy had been so arranged as to avoid interfering with the availability of funds for State

[1] For instance, the speech by Secretary Humphrey to the Investment Bankers' Association, 1 Dec. 1953, printed in the *Annual Report of the Secretary of the Treasury for the fiscal year 1953*, pp. 250–5, especially pp. 253–4.

[2] *Economic Report of the President, 1954*, p. iv.

[3] For official use of this term, see the statement by the Chairman of the Board of Governors of the Federal Reserve System to the Senate Banking and Currency Committee on 29 Mar. 1954. Printed in *Federal Reserve Bulletin*, vol. xl, p. 345.

and local governments and corporations and homeowners who needed investment finance.[1]

Undoubtedly the easy money policy was a major factor in the increase in housing construction that played an important part in the recovery from the recession. With credit supplies plentiful and interest rates falling, the 4½ per cent. VA and FHA mortgages were attractive investments and prospective house-builders could obtain finance on very liberal terms; in May 1954 25 per cent. of the VA guaranteed mortgages provided for no downpayment and 61 per cent. were for a period of 25 to 30 years.[2] The importance of the activities of government agencies in the housing boom can be seen from the following table, which compares the numbers of mortgages insured and guaranteed by the FHA and VA in 1953 and 1954:

TABLE VIII

Year	*Number of houses insured or guaranteed by FHA and VA*	*Percentage of all houses financed by mortgages*
1953 . .	408,000	39
1954 . .	582,000	48

Source. Economic Report of the President, 1955, Table D–32; *1956,* Table D–33.

The increase in housing construction in 1954 was spectacular, as is shown by the following table, which compares the 'value put in place' at seasonally adjusted annual rates in certain months in 1954 with the corresponding months in 1953:

TABLE IX

	Value put in place ($ billion)	
	1953	*1954*
June . .	12·4	13·2
October . .	11·7	14·5
December . .	11·8	15·7

Source. Economic Report of the President, 1955, Table D–29; *1956,* Table D–30.

Both the policy thus far described and the results achieved do not differ in any important respect from the policies pursued in 1949; then, as in 1954, easy money and liberal policies by the FHA and VA led to a sharp rise in housing construction. The parallel is even closer than this: an important institution in housing finance in 1949 was the Federal National

[1] Statement to the Senate Finance Committee, 7 Apr. 1954, printed in the *Annual Report of the Secretary of the Treasury for the fiscal year 1954,* pp. 225–30.

[2] *National City Bank Monthly Letter,* Aug. 1954, p. 90.

Mortgage Association (known as 'Fannie May'); this institution was allowed to expire in 1953 but was revived in 1954 at the President's request.

The one apparent difference between the policies of the Eisenhower and Truman administrations in the housing field was the part played by public housing. The Housing Act of 1954 authorized only 35,000 houses in one year, and the administration acquiesced, despite an original request for 140,000 houses over a period of 4 years. The Taft–Ellender–Wagner Act of 1949 authorized a programme of 135,000 houses a year for 7 years, but was largely nullified by totally inadequate appropriations, so that the difference between 1949–50 and 1954–5 is small if one judges by the number of houses actually built under Federal public housing programmes. None the less, there were in 1954 a number of demands for a large-scale public housing programme, some of them wildly extravagant.[1] This is an instance of a very common feature of the recession, demands from Democrats and their allies for measures far more drastic than anything undertaken in 1949.

3. (*b*) Fiscal Policy

The question of the fiscal policy pursued by the Eisenhower administration in 1954 is one of the most important and controversial aspects of the way the recession was handled. On the one hand one can say that the Eisenhower administration cut taxes by $7·4 billion and so greatly added to effective demand at a time when an increase in demand was badly needed, so that the tax policy was of great value in stabilizing the economy. But it is also possible to argue that the administration is not entitled to any credit for most of the tax cuts; that the reductions for which it was undoubtedly responsible were ill chosen and inadequate; and that in any case all that was done was to match a reduction in expenditures by a tax cut of equal size, which is not anti-deflationary at all but on the contrary has a downward balanced budget multiplier effect.

The tax reductions fall under four main heads. The excess profits tax expired on 1 January 1954, costing about $2 billion in a full year; the increases in the personal income tax imposed by the Revenue Act of 1951 also expired on the same date, at an estimated annual cost of $3 billion; the Revenue Act of 1954 provided for reductions costing about $1·4 billion; and the Excise Tax Reduction Act of 1954 cost an estimated $1 billion.[2]

[1] For instance former President Truman's demand in a speech to the Convention of the Amalgamated Clothing Workers of America, C.I.O. at Atlantic City, N.J. on 13 May 1954 for a housing programme to double the number of houses built (text of speech printed in the *New York Times*, 14 May 1954); and the demand of the Executive Committee of the A.F.L. for the building of two million houses a year (reported by the *Guaranty Survey*, Mar. 1955).

[2] Figures from the *Annual Report of the Secretary of the Treasury for the fiscal year 1954*, p. 44.

The expiry of the excess profits tax and the reduction of the income tax were automatic unless fresh legislation were passed to prolong them. The Act to postpone the expiring date of the excess profits tax from 1 July 1953 to 1 January 1954 was passed only after a prolonged struggle, with Representative Reed, the Chairman of the Ways and Means Committee, leading the opposition; moreover in his 1953 Budget Message the President had expressed the hope that taxes could be cut in 1954; and in September 1953 the administration's decision not to request postponement of the tax reductions scheduled for 1 January 1954 was announced definitively. By this time the reduction in military expenditure had begun and the signs of an approaching recession were becoming more definite. In this context the decision has the appearance of a piece of contracyclical policy and is so described by the 1954 Economic Report. Taking the other side of the argument, one feels it would be absurd to claim, as some Democrats have done, that because the income tax reduction was provided for under the Revenue Act of 1951 the Democratic majority of the 82nd Congress can claim the credit;[1] almost invariably tax increases are imposed for a limited period in the first instance, for the very proper and desirable purpose of ensuring that the need for these tax increases is frequently reviewed. There is much more foundation for the argument of Professor Samuelson that the political situation was such that for the administration to announce that it would not request postponement was like allowing the sun to set in the evening.[2] But it seems difficult to believe that had the administration believed the continuation of these taxes to be necessary, this could not have been achieved, although the fight would have been hard. In this context it is worth noting that in 1955 the President expressed a strong hope that taxes could be reduced in 1956, but when 1956 came he opposed any tax reduction on the ground that it would add to inflationary pressure; although this was election year and the purely political incentive to reduce taxes was greater than usual, there was little difficulty in securing the passage of legislation to keep taxation at existing levels.

When we turn to the reduction of certain excise taxes in 1954, this was indeed opposed by the administration. The credit for the excise tax reduction belongs to the Republicans in Congress and not to the administration.[3]

The most interesting controversies are those that surround the Revenue Act of 1954. This is an immense document, running to over 800 pages of text, but only two of its provisions are of real interest here, although the

[1] For instance Senator Barkley, in *Congressional Record*, vol. ci, p. 2728.

[2] In 'The Economics of Eisenhower', symposium in the *Review of Economics and Statistics*, Nov. 1956.

[3] The administration (in the person of the Secretary of the Treasury) approved 'selective' excise tax reductions, but opposed the Bill sponsored by the House Republican leaders (H.R. 8224) on the ground that the loss of revenue it entailed was too large.

cumulative effect of the minor changes in the personal income tax added slightly to personal incomes after tax. The two controversial provisions were the remission of tax on a certain amount of income derived from dividends and the accelerated depreciation of assets for tax purposes. The dividend credit was plainly a reduction that would accrue largely to the upper income groups and so would bring about the minimum increase in effective demand; indeed, it was of very little importance *vis-à-vis* the recession and its supporters based their case on equity. The accelerated depreciation was urged on the ground that it would stimulate investment in fixed capital. As the Secretary of the Treasury pointed out to the Senate Finance Committee[1] and to the C.I.O. Full Employment Conference[2] it was the heavy industries that were hardest hit by the reductions in defence expenditure and the most direct way to assist them was to stimulate investment.

On the other hand the Democrats advocated an increase in the individual exemption from personal income tax from $600 to $700.[3] This was sponsored in the House of Representatives by Minority Leader Rayburn and in the Senate by Senator George, the ranking Democrat on the Finance Committee, which made it 'official' Democratic policy if anything could. The case was based[4] explicitly on the need to add to the disposable incomes of consumers, which was regarded as more likely to add materially to effective demand than was the scheme to stimulate investment. This of course was not the only argument; the greater equity of a tax cut that benefited all taxpayers was stressed. The administration's arguments were that such a reduction would involve an undesirable loss of revenue, and also that it would remove a large number of people from liability to income tax, which was regarded as bad for political responsibility.[5]

It is impossible to give final judgement on the question of which of the two tax policies outlined above was the best suited to the situation, but some sort of assessment can be attempted. Let us take first the question of stimulating consumers' demand. Some of the supporters of the increase in the individual income tax exemption gave the impression that the issue was whether consumption ought to be stimulated as well as investment,[6]

[1] Statement on 7 Apr. 1954, printed in the *Annual Report of the Secretary of the Treasury for the fiscal year 1954*, pp. 225–30.

[2] Speech printed in the *Annual Report of the Secretary of the Treasury for the fiscal year 1954*, pp. 323–8.

[3] Some supported much larger increases in the exemption than this, to $800 or even $1,000.

[4] For instance, by Senator George, in broadcast on 16 Mar. 1954, quoted in *New York Times*, 17 Mar. 1954.

[5] By President Eisenhower in broadcast on 15 Mar. 1954; text printed in the *Annual Report of the Secretary for the fiscal year 1954*, pp. 221–4.

[6] For instance, Mr. Ruttenberg of the C.I.O. to the Joint Committee on the Economic Report, 26 Jan. 1955, published hearings, p. 159.

whereas the real question was whether any additional stimulation of consumption was required over and above that given by the 'automatic' income tax reduction of 1 January 1954, which was substantial, amounting to about 10 per cent. of tax liability for the lower and middle income brackets. Despite the fall in personal income before tax, disposable income did not fall at all. Personal income before tax and transfer fell from an annual rate of $278·2 billion in the third quarter of 1953 to a low point of $274·8 billion in the second quarter of 1954; this was offset by a fall of $3·4 billion in personal tax liability and a net increase of $1·9 billion in transfer payments.[1] The rise in transfer was clearly an 'automatic stabilizer', but about 70 per cent. in personal income tax liability was due to the reduction in the income tax rates.[2] The expiry of the excess profits tax may also have contributed to the stabilization of disposable incomes through facilitating the maintenance of the level of dividend payments; incomes from rent, interest, and dividends rose steadily throughout the period of the recession. The need for an 'emergency transfusion of purchasing power'[3] is thus by no means proved, though it is probably true that the increase in the personal income tax exemption would have done no harm, and might have brought about a rather more rapid recovery.

On the other hand there is not much evidence that the stimulation of investment was very effective. Business investment in plant and equipment continued to decline, reaching a low point in the first quarter of 1955. Investment in equipment, the type of investment most likely to be affected by changes in the depreciation allowances, declined from a peak of $22·7 billion (at seasonally adjusted annual rates) in the third quarter of 1953 to $19·2 billion in the first quarter of 1955,[4] a drop of 15 per cent. As a result of this, the electrical and non-electric machinery groups lagged behind the other groups in recovery from the recession, as is shown by Table X on p. 47.

Clearly, employment in the machinery groups had recovered much less than it had in durable goods manufacturing as a whole, despite the Secretary of the Treasury's contention that the administration's tax policy was the best way to help them. It is possible to claim that but for the stimulus given to investment by the Revenue Act of 1954, the situation would have been even worse; but this is incapable of proof except by a

[1] *Economic Report of the President, 1956*, Tables D–11 and D–12.

[2] It is estimated in the *1955 Economic Report*, at page 18, that of the decline in individual income tax liability, $2·4 billion was due to the reduction of the tax rates, and $1 billion was the automatic consequence of the fall in incomes. The 'automatic stabilizers' thus offset nearly all the decline in personal income before tax and transfer.

[3] The phrase is from the report of the Executive Committee of the A.F.L. to the Annual Convention in Sept. 1954, reported in the *Monthly Labor Review*, vol. lxxvii, pp. 1200–1.

[4] *Economic Report of the President, 1956*, Table D–7.

TABLE X

Industry group	*Employment in the second quarter of 1954, as percentage below employment in the second quarter of 1953*	*Employment in the second quarter of 1955, as percentage below employment in the second quarter of 1953*
Electrical machinery . .	13	10
Non-electric machinery .	11	9
(All durable manufactures) .	(11)	(7)

Source. Data in Kramer, 'A Review of Employment Trends in 1954 and 1955', *Monthly Labor Review*, vol. lxxviii, pp. 1105–11.

thorough-going inquiry company by company, businessman by businessman.

Was fiscal policy deliberately used for economic stabilization?

Let us now consider the question of whether it can be said that fiscal policy was deliberately used to offset deflationary tendencies, or whether all that happened was a downward balanced budget multiplier effect. One thing that seems certain from the budget figures in Table XI is that the

TABLE XI

The 'Cash' Budget

Fiscal year	*Receipts*	*Expenditures*		
		Total	*National security*	*Other*
1953 . .	71,283	76,554	50,423	26,131
1954 . .	71,636	71,868	46,681	25,187
1955 . .	67,836	70,548	40,796	29,752

Source. Budget of the United States for 1955, 1956, and 1957, Special Analysis A.

N.B. The cash budget measures payments to and receipts from the public by all Federal Government agencies, including the social security trust funds which are excluded from the conventional budget; payments from one government agency to another (e.g. interest on securities held by the trust funds) are also excluded.

The American fiscal year runs from 1 July to 30 June; 'fiscal 1954' began on 1 July 1953 and ended on 30 June 1954.

tax reductions of 1954 reflected a deliberate decision to postpone the balancing of the budget in the interests of stabilizing the economy. It seems that the dominant idea in fiscal policy in early 1953 was to bring the budget into balance as soon as possible; the drastic cuts in expenditure coupled with the insistence on postponing the expiry of the excess profits tax seem to admit of no other explanation. But after the recession had begun there was very little talk about balancing the budget; indeed, on

several occasions the tax reductions were pointed to as part of the action that was being taken to deal with the recession.[1] The most clear-cut acceptance by a member of the administration of the need to give economic stability a higher priority than balancing the budget is to be found in a speech by Secretary Humphrey to the National Canners' Association on 19 February 1955, which is worth quoting at some length, especially as the ideas expressed are at variance with the impression one gains of Mr. Humphrey's thinking on economic policy from his statements in recent months, such as at the famous (or notorious) Press Conference on the Budget in January 1957:

> *Question.* Why haven't we cut Government spending faster?
>
> *Answer.* The Government can only reduce its expenses by putting people out of work directly or indirectly . . . the Government spends most of its money for only two things: the employment of people working for the Government or the purchase of goods which are made by people who will be out of work if the orders are cancelled. Under these circumstances it would not be prudent to cut Government spending too fast even if it were possible to do so. . . .
>
> We constantly have in mind in making these reductions the necessity of creating new employment to absorb those who will be out of work.
>
> *Question.* In view of the big reductions that have been made, could the budget have been balanced?
>
> *Answer.* Yes, if we had not accompanied the heavy cuts we made in spending with substantial tax cuts, we could have balanced the budget. But we had to consider the sensitive balance of our economy. We knew that the heavy cuts in Government spending meant putting people out of work. We believed that we should cut taxes sharply and so give people added money to spend for themselves to create jobs for those who previously got their paychecks directly from the Government or from Government purchases. . . . The fact that the economic downturn was so quickly halted and that we are now proceeding upward on a broad front is proof that the policy of cutting taxes as we cut spending is a sound policy. The fact that consumer spending in the past year was the highest it has ever been is also good evidence of how tax cuts helped to make the successful economic transition.[2]

This is a very remarkable statement. Apart from the explicit avowal that the balanced budget had had to take second place to economic stabilization, there is the claim that the tax cuts promoted recovery by stimulating consumption.

It is interesting to compare the fiscal policies of the Eisenhower administration in 1954 with the policies of the Truman administration in 1949. The policies were very similar indeed. The budget deficit of 1949 was the result of 'automatic stabilization', for the reductions in the tax rates enacted over the President's veto in the Revenue Act of 1948 removed

[1] For instance, by the Secretary of the Treasury to the Joint Committee on the Economic Report, 2 Feb. 1954, text of statement printed in the *Annual Report of the Secretary of the Treasury for the fiscal year 1954*, pp. 219–21; and in statement to the Senate Finance Committee on 7 Apr. 1954 (op. cit., pp. 225–30).

[2] Text of speech printed in the *Annual Report of the Secretary of the Treasury for the fiscal year 1955*, pp. 294–9.

the likelihood of anything more than a balance in 1949 even if there were no economic decline, which was why in January 1949 the President recommended the imposition of tax increases to yield $4 billion of additional revenue. This request was abandoned later in the year when it became clear that deflation rather than inflation was the immediate problem. The 1949 recession was as severe as that of 1953–4, as is shown by the fact that in July 1949 unemployment as reported by the Bureau of the Census rose above 4 millions, a level reached at no time during the recession of 1953–4; yet the mid-year Economic Report of the President in 1949 expressed opposition to any tax changes that would result in a large net loss of revenues.[1] The tax changes recommended were the repeal of the excise tax on the transport of goods and more liberal provisions for the carry-back of losses for tax purposes; both were aimed at stimulating business rather than adding to the effective demand of consumers, and in this bore a striking resemblance to the programme of the Eisenhower administration embodied in the 1954 Revenue Act. It would seem, therefore, that the fiscal policies pursued by the two administrations were very similar indeed.

3. (*c*) Public Works

This similarity between the policies of the Truman and Eisenhower administrations is also apparent in the field of public works. Of all the remedies for a recession, public works may be expected to make the enthusiast for 'free enterprise at all costs' see red. It conjures up two of the great bogymen of Republican folklore, the WPA and Harry Hopkins. But there is no evidence to suggest that any ideological dislike of public works influenced the administration in 1954. In the message transmitting the 1954 Economic Report the President listed public works among the 'formidable arsenal of weapons' that the administration was prepared to use if necessary,[2] and on more than one occasion a member of the administration spoke of the planning of public works as one of the things the administration was doing about the recession.[3]

There is every reason to believe that the administration meant business in this field. The public works planning machinery was described to the Joint Committee on the Economic Report by Dr. Burns in the course of the hearings in 1955,[4] and the members were considerably impressed, notably Senator Douglas and Representative Bolling, who congratulated the administration on adopting the principles of the Bill they had intro-

[1] *Economic Report of the President, July 1949*, p. 8.
[2] *Economic Report of the President, 1954*, p. iv.
[3] For instance, President Eisenhower in the State of the Union Message, 7 Jan. 1954; and Secretary Humphrey in statement to the Senate Finance Committee, printed in the *Annual Report of the Secretary of the Treasury for the fiscal year 1954*, pp. 225–30.
[4] *Joint Committee on the Economic Report*, 24 Jan. 1955, published hearings, p. 23.

duced during the previous session to provide for the appointment of a public works co-ordinator. In addition to having the machinery ready for a new public works programme, it would appear that some use was made of existing programmes to provide a stimulating effect. The principal programme thus used was highway construction. In his statement to the Senate Finance Committee Secretary Humphrey listed the increase in highway construction as one of the measures taken to deal with the recession. The amount was not large in itself: expenditure by the Bureau of Public Roads rose from $573 million in the fiscal year 1954 to $636 million in the fiscal year 1955. It may well be true that the increase in expenditure on road construction was justified on other grounds, but it is clear that the administration was by no means unaware of the advantages from the point of view of economic stabilization. On the other hand, expenditures by the Corps of Engineers and the Bureau of Reclamation fell in the fiscal year 1955 compared with 1954. But the administration's moves in the field of public works were sufficiently realistic to cause disquiet to the *National City Bank Monthly Letter*,[1] a journal of impeccable conservatism, which is a feather in the Eisenhower administration's cap.

President Eisenhower was criticized by the Democrats for his expressed opposition to a 'slam—bang' public works programme in 1954. But the contrast with 1949 lay in what the Democrats proposed in 1954, not what the administration did. In his mid-year Economic Report in 1949 President Truman said that the economic situation did not require a large public works programme.[2] He advocated precautionary planning of public works; Congress was urged to vote money for aid to State and local governments in advance planning of public works and to facilitate advance planning by the Public Buildings Administration and the Bureau of Public Roads; a survey of school construction needs was also advocated.

Thus the Truman administration in 1949 did very much the same things in the field of public works as the Eisenhower administration did in 1954. It emerges from the foregoing consideration of the policies of the Truman and Eisenhower administrations in the fields of monetary, fiscal, and public works policies to deal with their respective recessions that the differences between their policies were slight indeed. One of the best pieces of evidence as to the mildness of the anti-recession policy of the Truman administration is the following comment by the *National City Bank Monthly Letter*:

> Business was also favourably impressed by the calm tone of the President's report and its eschewal of radical proposals. It was noted with approval that the President did not follow the lead of those who are clamoring for a new round of wage increases or for a vast program of public works to increase purchasing power. Its advocacy

[1] *National City Bank Monthly Letter*, Feb. 1954.
[2] *Economic Report of the President, July 1949*, p. 11.

of repealing the tax on the transportation of goods and liberalising the provisions for the carry back of losses was regarded as recognition of the need for encouraging business.[1]

The mid-year Economic Report of 1949 was just as confident as either the 1954 or 1955 Economic Report; if the charge of complacency could be fairly made against the Eisenhower administration in 1954, it could be made with equal justice against the Truman administration in 1949. President Truman said in the July 1949 Economic Report: '. . . our economy is still operating at high levels of employment and production. The kind of action that would be called for in a serious economic emergency is not called for now.'[2]

At this time, it must be emphasized, unemployment was at a higher level than it ever reached during the recession of 1953–4. The charge of complacency was freely made against the Eisenhower administration; take for instance the strong attack made by Senator Douglas and Representative Bolling in the Report of the Joint Committee on the Economic Report in 1954 against the administration for its alleged 'Pollyanna' outlook.

Underlying the similarity between the policies of the Eisenhower and Truman administrations was a similarity of basic outlook. In his last (1953) Economic Report President Truman said:

> This does not mean that we know enough to avoid economic fluctuations completely, or that we would want to if we could. . . . In response to anticipated or actual changes the economy is marked by a ceaseless shifting of resources from areas of lesser to areas of greater demand. Prices and employment are accomodated to the ebb and flow of demand, investment decisions are adjusted to changing conditions.
>
> This process requires the flexibility that is so characteristic of our economy. . . . The expansion of capacity may appear temporarily excessive, inventories may have been overbought, and waves of excessive optimism and pessimism may appear in the economy. These factors must lead to some fluctuations in the level of business. This is part of the price we pay for a dynamic economy, and it is not too high for what we gain.[3]

It is most unlikely that President Eisenhower would wish to dissent from any of this; or from the following: '. . . it does not follow that we should not do our best to maintain full employment or that we should wait until small recessions begin to spiral before seeking to reverse their course or prevent their becoming large depressions'.[4]

4. Recovery

Let us now consider the policy of the Eisenhower administration in the recovery, which may be dated from about September 1954, when the indices of industrial production turn definitely upward, till about the

[1] *National City Bank Monthly Letter*, Aug. 1949, p. 86.
[2] *Economic Report of the President, July 1949*, p. 5.
[3] *Economic Report of the President, 1953*, p. 15.
[4] Ibid., p. 16.

middle of 1955, when recovery was practically complete except for unemployment, which remained above the 1953 levels, as it has done ever since. The Federal Reserve policy of 'active ease' was altered to 'ease' in late 1954, that is to say, the easy money policy became gradually less aggressive, and in April 1955 the rediscount rate was raised, a clear sign of a more restrictive policy. This restrictive policy had its echoes elsewhere; the 1955 Economic Report took the view that policy should be concentrated on long run growth rather than on an 'immediate upthrust', and the proposal sponsored by Democratic leaders in the House of Representatives for a reduction in the personal income tax of $20 for each taxpayer and his dependants was vigorously opposed by the administration as inflationary.

This easing of action to bring about a recovery which was apparent at about the turn of the year when recovery, judged by the Index of Industrial Production, was barely half complete, gave rise to a good deal of controversy. In a statement to the Joint Committee on the Economic Report, Mr. Reuther was very critical of the administration for this, denouncing the Secretary of the Treasury for having a 'banker mentality' which led him and others in the administration to begin putting the brakes on when they should have been stimulating further growth.[1] The Democratic members of the Joint Committee on the Economic Report charged that: 'Emphasis on fighting an inflation "straw man" at the expense of what should be the primary objective of economic policy—maximum employment and purchasing power—accounts in large part for the disturbing level of unemployment.'[2]

They criticized in particular the tightening of monetary policy, expressing the opinion that the risk of encouraging inflation was less than that of discouraging recovery.

In the debates on the 1955 Tax Bill, one of the commonest arguments in favour of the proposed tax cuts was that unemployment was still far too high, and that additional stimulation of the economy was desirable; in contrast to this the Republicans, or all but a half-handful of them, adhered to the administration's view that any tax reduction would involve serious inflationary risks. There were other arguments used, of course, including the alleged greater equity of a tax cut that benefits all taxpayers equally, and a number of purely political arguments, but as far as can be seen the risk of inflation versus the risk of restricting the recovery seems to have been the source of a genuine disagreement between the majority of both parties, the Republicans being more afraid, by and large, of inflation than of hampering recovery.

[1] 10 Feb. 1955, published hearings, p. 1153.
[2] *Report of the Joint Committee on the Economic Report, 1955*, p. 10.

The Federal Reserve System was accused of having an 'inflation complex', and the then Governor of the Federal Reserve Bank of New York, Mr. Allan Sproul, addressed himself to this charge in a speech in which he agreed that the Federal Reserve System was very much concerned about inflation, but held this to be desirable in view of the fact that 'a host of politicians and large groups of our population' did not share this concern to anything like the same degree. He went on to express the fear that 'this call for Government action to promote maximum—not full—employment, production, and purchasing power' would lead to a monetary policy that would embrace creeping inflation.[1] This speech expressed in sharp and clear form what seemed to be the view of the administration and most Republicans once the recovery was well under way.

The question has to be asked whether policies in this respect differed significantly in 1950. As regards the Federal Reserve System, any real difference is not readily apparent. About November 1949 the System began to moderate the easy money policy that had been in effect since the spring, and in January and February 1950 reserve requirements were raised two percentage points above the low point to which they were reduced on 1 September 1949. There was no complaint about this from the Democrats in the *Report of the Joint Committee on the Economic Report, 1950*, so that it would appear that once again views have changed with the passage of time and the change of administration. When we consider fiscal policy, the tax changes proposed by the President early in 1950 were of a structural kind and intended to yield a net increase in revenue. Altogether, it seems impossible to detect a greater degree of concern about the level of unemployment among the Democrats in early 1950 than among the Republicans in early 1955.

5. Conclusion

It would thus appear that both the policies pursued and the basic attitudes on what the Government should do about deflationary tendencies in the economy were remarkably similar in 1949–50 and 1953–5. It is worth noting that the Eisenhower administration's policy came under fire from the Right as well as from the Left. For instance, the editor of *The Journal of Commerce* told the Joint Committee on the Economic Report that the recovery in 1954 had been sparked by 'artificial, inflationary stimulants', and that the recovery would prove abortive, like that of 1950, since government intervention had only postponed the showdown.[2] He

[1] Speech at Pullman, Wash., on 7 Apr. 1955, quoted by the *National City Bank Monthly Letter*, May 1955, p. 54.

[2] Dr. Heinze E. Luedicke to the Joint Committee on the Economic Report, 26 Jan. 1955, published hearings, p. 140.

proved to be wrong about 1955, and there is no reason to believe that his analysis of the 1950 situation was any sounder.

Of course, to demonstrate that the anti-recession policies of the Eisenhower administration did not differ very much from those of the Truman administration does not of itself demonstrate that they were sound and adequate. But at the risk of being charged with reasoning *post hoc ergo propter hoc*, it seems reasonable to conclude that the recovery in both 1949 and 1954 was materially aided by the policies outlined above. The economic policies of the Eisenhower administration suggest that the Republicans have indeed learnt a great deal since 1933. Here is what Professor Galbraith had to say on this point to the Joint Committee on the Economic Report:

> I am impressed . . . by the grace and ease with which the administration has dispensed with its slogans and abandoned its cliches about the absolute virtues of hard money, the absolute necessity of balancing the budget, and the unspeakable evils of deficit financing. . . .
>
> In 1935, in a letter to George Bernard Shaw, the late Lord Keynes said: 'I believe myself to be writing a book on economic theory which will largely revolutionise—not I suppose at once but in the next 10 years—the way the world thinks about economic problems'. That to be sure was twenty years ago. Still, had Keynes been pressed, he might have allowed himself a little more time to capture a Republican administration.[1]

The record of the Eisenhower administration as outlined in this paper seems to justify Professor Galbraith's view. Whether the differences of opinion between the parties about the respective risks of inflation and of hampering recovery and growth by a too restrictive policy represent a real difference between Eisenhower economics and what a Democratic administration would do is a very interesting question, but one that cannot be answered until there is a Democratic administration in power at a time when the economy begins to flag, and this will not be till January 1961 at the earliest. Until this evidence becomes available, the conclusion must be that there is just as much a bipartisan overall economic policy as there is a bipartisan foreign policy, though both are liable to be obscured from time to time by relatively minor specific points of disagreement and party polemics. In both cases if one judges mainly by policies pursued when in office rather than by opinions expressed when in opposition, the differences appear to be small indeed.

[1] Jan. 1955, published hearings, p. 389.

INTERTEMPORAL RELATION OF DEMAND AND THE PREFERENCE SYSTEM OF THE FIRM[1]

By SYED AHMAD

I

THE present note deals with the behaviour of firms in the situations in which demand for their products in one period depends on their prices (or outputs) in another period. Its purpose is to give a geometrical version of the mathematical model recently presented by Professor Hicks and subsequently discussed by F. Hahn and Paul Streeten.[2] But the opportunity has also been taken to comment upon some of the important concepts used in the discussion.

The reason which has generally been given (and to which we shall confine our discussion) for the existence of this intertemporal relationship between demand and prices is the entry or exit of the competitors in response to the price or output policy of a firm.[3] Thus if a firm fixes a high price it is assumed that the potential competitors begin to find it profitable to enter into the neighbourhood[4] of that firm. If it fixes a low price, some competitors may no longer find it profitable to continue production. In the former case the share of the firm in the total demand for the product of the industry (assumed constant) decreases, and the demand *curve* shifts to the left. In the latter case this share increases and the demand curve shifts to the right. The reason why this cause (change in the price) and effect (shift in the demand curve) are assumed to belong to different periods is that the competitors need time to build new plants when the firm fixes a high price; and also to use them up when the firm fixes a low price. The period in which the demand curve has not yet shifted may be called Period One; the remaining part of the economic horizon of the firm may be called Period Two. Then we can say that the demand curve of Period Two is a function of the price of Period One, and the demand curve of Period Two corresponding to a lower price of Period One is higher than, or at least the same as, the demand curve of Period Two corresponding to a higher price of Period One. An assumption which, in a

[1] I must thank Dr. Ozga without whose constant help and encouragement the writing of this paper could not have been possible. I should also thank Miss Olive Coleman who read and corrected more than one draft of this paper. (The responsibility for the views expressed and for any faults in exposition is, of course, entirely mine.)

[2] J. R. Hicks, *O.E.P.* Feb. 1954; F. Hahn, *O.E.P.* Oct. 1955; and Paul Streeten in the same journal.

[3] We shall assume that the demand is fully met at the price set by the firm. That is, the customers are not allowed to queue at the shop windows. Then we can (alternatively) say that the firm fixes a higher price or lower output and vice versa.

[4] Either spatial or qualitative.

way, is implied in the dichotomy of the Periods, is that the demand curves we get for these Periods remain constant in each of the Periods separately, though, of course, they may not be the same in both.

The Period dichotomy here must not, however, be confused with the distinction between the short and long period of Marshall. Marshall's short period is that in which the stock of appliances cannot be varied.[1] Now the stock of appliances can be varied in, at least, two directions—one designed to increase the size of the firm, and the other to reduce it. There is no reason why the time taken for installing a plant should be identical with the time for using it up.[2] If it is different, then we have *two* short periods in the Marshallian sense according to whether we are considering an increase or a decrease in the size of the firm. The long period in both cases will begin at the end of the short period and will continue indefinitely.

The concept of each of our two Periods also will be different in the case of an expected entry of the potential competitors in response to high prices and in the case of an expected exit of the competitors in response to low prices. Take first the case of the expected entry. If we assume that all of the competitors decide to set up their plants exactly at the time the firm announces its price, then Period One will equal the short period of Marshall *for increasing the size of the firm*. Period Two is the difference between the economic horizon of the firm and Period One, and must obviously depend on the economic horizon. Only if we assume that the economic horizon of the firm is of infinite length, can we identify Period Two with Marshall's long period. This may be the way in which Professor Hicks has identified the two Periods with Marshall's short and long periods.

But this is only one of the possible assumptions about economic horizon. The economic horizon may also be the life of the plant—an assumption which Professor Hicks seemed to have in mind when he wrote, 'It is reasonable to assume that the plant which will be put up will be fairly durable —of a durability which is long in relation to the length of the closed period [Period One].'[3] In that case Period Two becomes the difference between the *two short periods of Marshall's*, one for using up of the plant (by the firm) and the other for increasing it (by the competitors). There are also other plausible assumptions about the economic horizon. For example it can equal the entrepreneur's expectation of his own life, or that of his son. It seems therefore advisable not to confuse our two Periods with the short and the long period of Marshall's. For this reason we shall continue to call them Period One and Period Two.

[1] *Principles*, 8th ed., p. 374.

[2] On the other hand, if reducing means just not working it, then the closure can be almost instantaneous; and there will not be any short 'period'. In what follows reducing of the plant will mean using it up.

[3] Op. cit., p. 42.

In the case of an expected exit of the competitors (and the consequent *increase* in demand in Period Two as compared with Period One), the length of Period One will depend on the time which elapses before the competitors close down their plants. If we assume that at the time the firm reduces its price all the competitors have new plants, and that they go out of business only when they use up their plants, then Period One will again equal the short period of Marshall, but this time the short period for decreasing or for using up of the plant. Period Two, as in the case of expected entry, will be the difference between the economic horizon of the firm and Period One. If, as is generally assumed, the building of the plant takes shorter time than using it up, then Period One, in the case of expected entry, will be shorter than Period One in the case of expected exit. The opposite will be true for Period Two (with the same economic horizon). If the economic horizon of the firm is the life of its plant, and the expected time for using up the plant by the firm is the same as that of its competitors, Period Two will obviously be zero. This could be the reason why Professor Hicks did not discuss the case of expected exit of the competitors.[1]

II

Using the relationship between the price and demand of the two Periods we can now proceed to construct a profit-possibility curve which shows the maximum combinations of the profits in the two Periods, both for the case of the expected entry and for the case of the expected exit of the competitors. In Fig. 1 (A and B) SAC represents the average cost (let us say per week) corresponding to the plant of an arbitrary size S_1[2,3]. In Fig. 1A it is confronted with the demand (per week) curve of Period One, SD. Take then an arbitrary price P'. At this price the amount of profit (per week) is $P'F'G'H'$.[4] The demand curve of Period Two corresponding to the price P' in Period One is shown by LD_1 in Fig. 1B. From the LD_1 and SAC curves we obtain the most profitable output OQ' and the most profitable price $Q'L'$ (through the intersection of the marginal curves). The profit in Period Two is then $K'L'M'N'$. Thus we have $K'L'M'N'$ profit in Period Two against $P'F'G'H'$ profit in Period One. This combina-

[1] The reason given by Professor Hicks is, however, different (op. cit., p. 53). He writes that if the increase of demand due to Period One price policy is possible and 'goes on being possible', then the firm will begin to dominate the industry. It is clear, however, that 'goes on being possible' need not be in respect to all competitors. Thus the process might stop after the exclusion of one or two competitors. In that case, the firm may expand its Period Two demand through Period One price policy without dominating the industry.

[2] It is assumed that the firm has a single plant.

[3] The average cost curve may or may not touch the long-run average cost curve at any point. To this we shall return later.

[4] The time dimension of profit, cost, &c., will not be mentioned in what follows. It will be understood, however, that they have the same dimension (per week) throughout.

tion of profits can be represented by a point on a diagram in which the vertical axis represents the profit of Period One and the horizontal axis the profit of Period Two (see Fig. 2). Take then another arbitrary price P'' in Fig. 1A (Period One). The profit of Period One will then be $P''F''G''H''$.

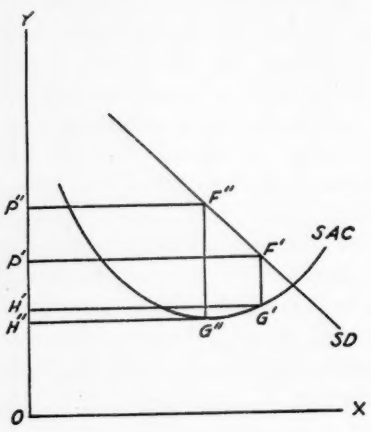

Fig. 1A

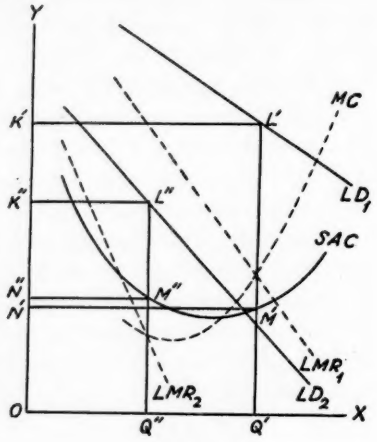

Fig. 1B

As P'' is higher than P', the demand curve of Period Two corresponding to P'' will normally be lower than LD_1 (Fig. 1B). Let this demand curve be LD_2. Then the maximum profit of Period Two calculated in the usual way will be $K''L''M''N''$. The combination of the two gives us another point in Fig. 2. In this way we can obtain a large number of points by varying the price in Period One. By joining these points we obtain the 'profit-possibility curve' for the plant S_1, shown by S_1S_1 in Fig. 2.

It is not possible to say exactly what will be the shape of this curve unless we know the shape and position of all the demand curves of Period Two resulting from the different prices of Period One. In most cases this curve will consist of three distinct parts as shown in Fig. 2.[1] At one extreme there will be a range in which due to 'inappropriately high' price in Period One the profit of Period One itself is less than it would be at lower prices. The profit of Period Two will, of course, be lower with higher prices in Period One than with lower prices. Thus with a rise in price in Period One, the profits of both the Periods decline together; the profit-possibility curve has a positive slope (the S_1M_1 range of the S_1S_1 curve). At the other extreme there will be a range in which the price in Period One is so low that it does all it can to shift the demand curve in Period

[1] The cases in which this will not occur become important in another context, to which we shall return later.

Two to the right. Any further reduction of Period One price does not, therefore, lead to any increase in profit in Period Two; the profit possibility curve is vertical (the S_1C_1 range of S_1S_1 curve). The points M_1 and C_1 correspond to the maximum profits in Period One and Period Two

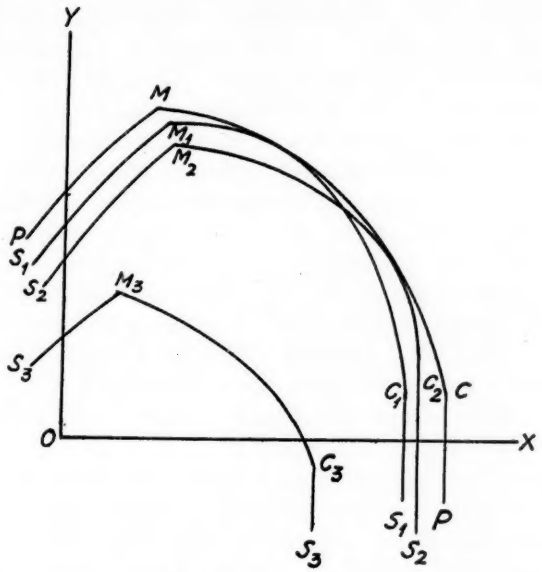

Fig. 2

respectively. Between these points the profit-possibility curve is downward sloping; the higher the profit in Period One the lower the profit in Period Two.

All these observations refer to the *p-p* curve (profit-possibility curve) of the plant of the size S_1. Let us take now the plants of the sizes S_2, S_3, S_4, &c. By repeating the process in Fig. 1 with the cost curves corresponding to those plants we can obtain as many *p-p* curves as we have plants. The envelope of these will give the *total p-p* curve of the firm shown by *PP* in Fig. 2.[1] It has the same three ranges as the *p-p* curve of a plant. The *M* and *C* represent now the maximum profits in Period One and Period Two respectively if the plant is allowed to vary. We shall call the price and output corresponding to *M* 'monopoly' price and output and those

[1] It would be possible to find this total *p-p* curve by first taking a price in Period One as given and altering the size of the plant. This would give us the *p-p* curve corresponding to a given price in Period One. By varying this price and repeating this process, several such curves would be found. An envelope of these would give the total *p-p* curve.

corresponding to C 'critical' price and output.[1] Thus, the monopoly output of Period One is that which gives the maximum profit in that Period, irrespective of what happens to the profit of Period Two; and the critical output of Period One is the smallest output of that Period which can shift the demand curve of Period Two to its highest position.

But in some cases the p-p curve[2] may have two ranges only, one positively inclined and the other vertical, without the negatively inclined range between them. This situation obtains when the monopoly output of Period One is greater than (or equal to) the critical output of the same Period, *and* the marginal revenues derived from the demand curves of the two Periods (for Period Two the highest demand curve will be chosen) are equal at that monopoly output. The first condition ensures that any variation of the output of Period One from the monopoly level (and hence a reduction of profit of Period One from its maximum level) will not increase the profit of Period Two from the plant best suited to produce the monopoly output of Period One. The second condition ensures that the profit of Period Two cannot be increased by choosing another plant (and thus reducing the profit of Period One). If both these conditions are fulfilled, the substitution of the profit of one Period for that of the other is not possible. Hence there is no negatively inclined range of the p-p curve.

This must be the case if the demand curve of Period Two is independent of the price of Period One, and this independent demand curve of Period Two is the same as the demand curve of Period One.[3] The independence of the demand curve of Period Two is a sufficient (but not a necessary) condition for the monopoly output of Period One being greater than (or equal to) the critical output of the same Period. The equality of the demand curve is again a sufficient (but not a necessary) condition for the marginal revenues corresponding to them being equal at the monopoly output of Period One. Thus, the two conditions mentioned above are fulfilled and in this case we do not get a negatively inclined portion of the p-p curve. In the case in which the demand curve of Period Two is independent of the price of Period One, but is different from the demand curve of Period One,[4] only the first of the conditions is necessarily fulfilled. The second condition, viz. the equality of marginal revenues corresponding to the two demand curves at the monopoly output of Period One might be fulfilled only by accident. Therefore, the possibility of substituting the profit of one Period for that of another by altering the size of the plant

[1] The latter is Professor Hicks's term (op. cit.). In the diagram both M and C have been shown in the all-positive quadrant. This need not be so.

[2] For the remainder of this paper the p-p curve stands for the *total* profit possibility curve unless otherwise specified.

[3] This is the textbook demand curve or 'simple expectation' of Professor Hicks, op. cit.

[4] Analogous to Hicks's 'polypolistic expectation'.

may remain, and the negatively inclined range of the *p-p* curve may not disappear.

It might be noted at this point that in the construction of the total *p-p* curve we have not made use of the long-run average cost curve at all. This is not only because being in search of one envelope we could dispense with another; but also because the short-run average cost curve corresponding to any point on the *p-p* curve need not touch the long-run average cost curve at all. The reason is that if we plan to produce more than one output from a plant, the long-run average cost curve is no longer relevant.[1] Any reference to the long-run average cost curve in the discussion of the intertemporal relation of demand would thus not only be unnecessary but it might prove misleading.

III

So far we have been discussing what possible profits the firm can earn in the two Periods. We must now examine the way in which the firm makes a choice between them. The novelty of Professor Hicks's approach is that it allows the different firms to give different relative weights to the profits of the two Periods. Thus the profit of one Period need not be translated into the profit of the other by a single rule of discounting. If such translation were possible, the problem would be to maximize the sum of the discounted profits. This, for example, was done by Mr. M. W. Reder.[2] But if the translation is not possible, the firm does not maximize an unambiguous profit; it maximizes some sort of a utility index, which is a function of the profits of Period One and of Period Two. And in the case of two Periods the function can be represented by a system of indifference curves.

What is the form of these curves? As the first approximation we may assume that the rate of substitution of the two profits, one for the other, is independent of the amounts of profits already held, although it may not be the same for all the firms (otherwise a simple rule for translating one profit into another could be found for all firms). This will give straight line indifference curves, their slopes varying from firm to firm. In the limiting case of a zero weight being attached to the profit of one Period as compared with that of another, the straight line indifference curves become horizontal or vertical, depending upon to which of the two profits we attach such weight. The firms having those latter two extreme systems

[1] George Stigler, 'Production and Distribution in the Short Run', *J.P.E.* June 1939, p. 316; and A. G. Hart, 'Anticipation, Uncertainty and Dynamic Planning', *The Journal of Business*, University of Chicago Press, Oct. 1940, Part ii, p. 59.

[2] 'Intertemporal Relation of Demand and Supply within the Firm', *The Canadian Journal of Economics*, 1941, pp. 25–38.

of preferences were called Snatchers and Stickers by Professor Hicks. Their indifference curves are shown by I_1s and I_3s in Fig. 3.[1]

But we need not confine ourselves to the straight line indifference curves. We may take into account the possibility that the preference of the profit of one Period over the other depends on the amount of those

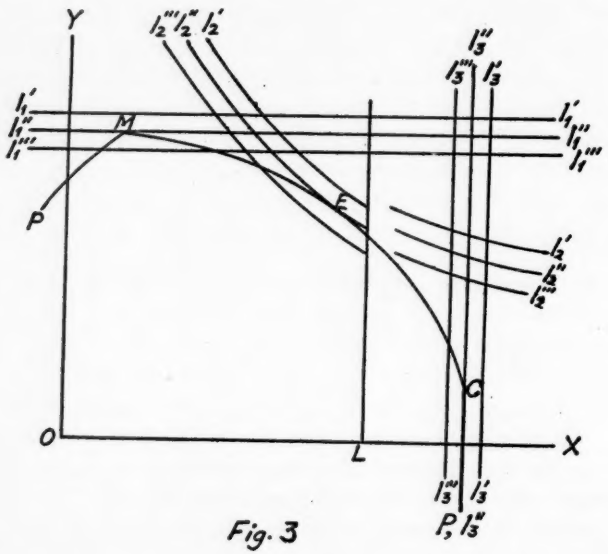

Fig. 3

profits.[2] It means that it is not possible now to find a simple formula for converting the profit of one Period into that of the other even for one firm; Mr. Reder's method is inapplicable. The indifference curves are then not straight lines. We can expect them to be smooth, except at the point where the significance of the two Periods changes suddenly. In our model this may happen where the increase in the profit of Period Two ceases to be due to the prevention of *entry* and begins to be due to *exclusion* of the existing competitors. As we saw in Section I this changes the basis of the Period dichotomy; each of the two Periods becomes of different length. As the exclusion of the competitors means that the demand curve of Period Two is higher than the demand curve of Period One, the sudden change in the basis of Period dichotomy must take place where the demand curve of Period Two is *the same as* the demand curve of Period One. The respective point on the p-p curve is, thus, where the

[1] Where, as in Fig. 2, the vertical axis represents the profit of Period One and the horizontal axis the profit of Period Two.

[2] For example, if the firm has financial difficulties in Period One.

horizontal distance (representing the profit of Period Two) of *p-p* curve equals its maximum vertical distance. So long as only potential competitors are allowed to enter, the profit of Period Two will not exceed the maximum profit of Period One. The point where the former equals the latter (and begins to become greater) is where the concept of the Periods changes suddenly. The indifference curves are, therefore, not independent of the *p-p* curve if we consider both the entry and the exit of the competitors. They take the shape of the curves in Fig. 3 denoted by I_2s. At *OL* abscissa the curves shift to the right and also become less steep. The reason is that the time taken for using up the plant (when the exit is assumed to take place) is longer than the time taken for building it (when entry is assumed to take place); the weight given to the profit of Period One is greater in the latter case than in the former. If the firm does not consider the exit of the competitors in Period Two,[1] the horizontal distance of the *p-p* curve will never be greater than the maximum vertical distance, and there will be no sudden shift in the indifference curves in the relevant range. Whatever case we take, the indifference curves will not have a positive inclination, because the utility which the firm maximizes is a monotonically increasing function of the profits of the two Periods. In fact, if we confine our attention to the case where the firm tries only to prevent entry, then these curves will be very similar to the consumers' indifference curves. One important difference, however, must be noted. In the consumers' case the spread of the indifference curves beyond the two axes is not significant because there cannot be a negative consumption of any commodity. In our profit indifference curves[2] the firms' *planning* for a loss for one of the two Periods cannot be excluded from consideration. The spread of the curves beyond the axes may thus be significant.

The *p-p* curve confronted with the set of indifference curves gives us the equilibrium combination of profits as indicated by the point of tangency. This point gives us also the size of the plant and the corresponding average cost curve. As the demand curve of Period One is given, the profit of that Period gives us its price and output (the larger of the two outputs will be chosen). The price of Period One determines the demand curve of Period Two. By using the average cost curve and the profit and demand in Period Two, we can find the planned output and price in Period Two as well. In Fig. 3, *M*, *E*, and *C* indicate the equilibrium combinations of profits corresponding to the different sets of indifference curves, I_1, I_2, I_3. The systems I_1 and I_3 correspond to Snatchers and Stickers, and

[1] For example, because its economic horizon is equal to the life of the plant and therefore Period Two for the exit of the competitors does not exist.

[2] These, of course, have nothing to do with Stackelberg's profit indifference curves.

they give the monopoly combination M and the critical combination C respectively.[1]

The fact that the profit indifference curves cannot have a positive slope helps us also to see that out of the three possible ranges of the p-p curve, the possibility of alternative choice exists only in the negatively inclined range; because it is only in this range that the profit indifference curves (being themselves negatively inclined) can be tangential to the p-p curve. Thus, in the cases in which the negatively inclined range is completely absent from the p-p curve, the problem of choice does not arise. The chosen combination will always be the highest point on the p-p curve. Here the profit indifference curve has no role to play.

We have seen at the end of Section II that the above situation obtains when the monopoly output is greater than the critical output of Period One, and the marginal revenues due to the demand curves of the two Periods are equal at that monopoly output. This is the only case in which 'it does not after all matter whether the firm is a Sticker or Snatcher'.[2] This case, however, obtains not only because a firm 'by its low price policy can be *sure* of excluding all competitors',[3] but also because this low price is assumed to be high enough to give the firm the maximum profit in Period One as well; *and* although it excludes all the potential competitors, it does not exclude any of the actual ones; the demand curve in Period Two remains in the same position as it was in Period One.

Finally, we may usefully remind ourselves that the analysis has been based on the assumption that while the high price in Period One leads to entry in Period Two, the firm can maximize its Period Two profit (given Period Two demand curve) without fear of any further entry. But if, as is generally assumed, Period Two is longer than Period One, then a rise in price in Period Two above that of Period One may lead to further entry, and the analysis cannot be carried with strict dichotomy of Periods: a multiperiod mathematical formulation along the lines indicated by Mr. Hahn[4] will be necessary. If the firm does not want any entry to take place after the first wave has come, then it will maximize its Period Two profit (Fig. 1 B) subject to the restriction that the *price* in Period Two is not higher than the *price* in Period One. In that case the p-p curve will first be a straight line rising at an angle of 45 degrees,[5] then at an increasing

[1] Though the Snatchers and the Stickers will always choose M and C respectively, the reverse is not necessarily true. That all those who choose M are not necessarily Snatchers is shown by the kink at M in Fig. 3. This means that many sets of indifference curves, and not only the horizontal ones, will give M as the chosen combination. A similar argument applies to C.

[2] Hicks, op. cit., p. 51.

[3] Ibid. Italics in the original.

[4] Op. cit.

[5] Up to the point at which the price of Period One is below the critical price. The same will happen if the restriction is not that the price of Period Two is lower than the price of

angle with X-axis, and ultimately inclining negatively as in the usual case.[1] The slope of 45 degrees and the subsequent increase indicate that at none of the combinations of profits, the profit of Period Two is greater than the profit of Period One, whatever the system of preferences. However, the usual problem of choice remains, and will be met in the usual way.

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Period One, but that the output of Period Two is larger than the output of Period One. But the shape of the curve beyond this point will be different. None the less, the main conclusions of the text are valid for both cases.

[1] The angle with the axes can either be actual or projected.

THE DEVELOPMENT OF THE TIED HOUSE SYSTEM IN LONDON

By D. M. KNOX

THE name of 'Tied House system' is used to describe the ownership of licensed houses by brewers, who lease the houses to tenants on condition that only beers supplied by the owners of the houses shall be sold in them. There is usually no requirement as to brands of wines or spirits sold in these houses. The brewer owns either the freehold or leasehold of the premises, and lets it as a tenancy at will; but the tenants are the actual licensees, and usually remain in the houses for many years; while at the death of a licensee it is common for the tenancy to be transferred to a member of his family. The tenant of a tied house pays a rent well below the normal market value of such a house, but does not receive such a large discount on his beer account as the tenant of a house not 'tied' to the brewers. The brewers make themselves responsible for all repairs. This system is known as the 'wet' rent, and by it the risk of bad trade is shared between brewer and tenant.

It appears to be generally assumed that the development of this system was the result of acquisitiveness on the part of the brewers, or a tendency towards oligopolistic methods of trade on their part, or in a search for increased profits. This was not so. The system appeared in London in the last decade of the nineteenth century, to replace the older London method of financing the retail trade by loans from the brewer on mortgage to the licensee. That the change was not made at the wish of the brewers, that it was financially and administratively contrary to their interests, will be shown in this article.

The question of why ownership of the retail outlets, or financial control over them, should have developed so early and so comprehensively in the licensed trade is one that has already been adequately answered by historians. Sidney and Beatrice Webb, writing in 1903, said of the growth of such control in the period 1816–30:[1]

> When the Justices made it a practice, before granting a licence, to require that the applicant should show that he occupied premises suitable for the business, they insensibly passed into virtually licensing the houses, as well as the particular occupiers. It then became inevitable that the brewers, commanding large capitals, should advance money to enable the necessary alterations to be made, and thus obtain control of a large proportion of the premises on which drink was sold, either by simple purchase of the property, or by the publican's indebtedness. It was reiterated on all sides, that the limitation of the number of public houses, their alteration and

[1] *History of Liquor Licensing in England Principally from* 1700 *to* 1830, pp. 88–89.

enlargement to suit the requirements of the Justices, the insistence on substantial sureties for good behaviour, and the general increase of pecuniary responsibility, all fostered the tied house system.

In fact, limitation in the number of retail premises licensed to sell alcohol also gave premises holding such licences a special value over and above that of the premises themselves, and the acquisition of premises having such 'monopoly value' (as it came to be called) required greater capital than was possessed by the class of people wishing to enter the retail trade.

In many trades wholesalers' loans, or goods advanced on credit, form an important part of the retailers' working capital. But there are certain special factors in the licensed trade which make capital advances more important. Firstly, the licensee specializes in a very limited number of types of goods, and is therefore dependent on fewer wholesalers for larger amounts of credit. Secondly, the loans were required to pay for something which was in its nature precarious, because it depended on a licence which could at all times be lost through misconduct, and, from 1890 to 1904, merely because the licensing justices considered the house redundant. The insecurity of the licence, therefore, militated against obtaining capital from anyone who was not going to obtain a trading advantage from the loan, and also made the wholesalers desirous of sufficient control over the licensee to prevent the possible loss of their investment.

There were other reasons, too, why the brewers liked to exercise some control over the licensees. Beer is a perishable commodity; so that stockpiling is not possible, except in a few lines, and therefore a regular and steady demand is necessary for economic production. Secondly, the brand name became an important factor at an early date, and draught beer was particularly liable to deteriorate when stored in the retailer's cellar under unsatisfactory conditions; and also easy for the retailer to adulterate in the hope of extra profits, so that brewers sought some control over retailers to protect the good name of their product. Lastly, and especially in the latter half of the century, where the trade was not tied, there was great danger of disastrous discount wars, which were particularly hard on wholesalers of a perishable product where the retail outlets were limited in number.[1]

All these factors combined to make some form of control by the brewers of retail outlets common in the nineteenth century throughout England. But methods, and degrees of control, varied at different dates in different parts of the country; so that generalizations for the country as a whole are impossible. This article is concerned with London alone and does not even apply to many of the outlying suburbs of London.

[1] The fact that distillers' and wine merchants' financial control of the retail trade has always been much less than that of brewers is largely due to the less perishable nature of their products.

Where property values and property ownership are concerned, London is a special case. Until recently freehold properties were rarely in the market; most properties being held on long building leases at low ground rents, but for the leases of buildings very high premiums had to be paid. Exact figures of the number of brewer-owned houses in London before 1890 are not available; but they probably did not exceed 600, if they reached that figure, in 1860,[1] and in most cases such houses had not been bought deliberately by the brewers. Thus, before 1890, nearly all London publicans owned the leases of their public houses; but because the price of the lease was high, they obtained a large part of the purchase price on mortgage from a brewer, who in return obtained the promise of the publican's custom for at least all mild ales and porter. This was known as the 'London' or 'loan' system, sharply distinguished from the system common in many parts of England at the time, whereby the brewers were the freeholders or leaseholders of the licensed houses, and sub-let them to publican-tenants or appointed managers to run them. The 'country' system did not commend itself to most London brewers; freeholds were rarely available in London, while leaseholds would diminish constantly in value, and the purchase of either would have involved an investment on a scale beyond the resources of the brewery partnerships of the time. This is particularly true after 1870, when London property values soared.

The retailers were thus dependent on the brewers for the supply of capital with which to enter the business.[2] They had greater freedom than country publicans who were brewers' tenants, because they could at any time change their wholesaler at 24 hours' notice, obtaining from the new brewer a loan by which they were able to pay off their former brewer. Thus any publican dissatisfied with his wholesaler or his supplies could take his custom elsewhere. On the other hand the retailers bore the full responsibility for the expenses and upkeep and repair of their houses. Nevertheless, many appear to have paid off their loans from the brewers in fairly short periods.

The 'Loan' system began to show its defects in the eighteen-eighties. There are a number of reasons for this. Where the retailers were concerned the increase in overheads, due to the rising prices of London property, rising rates[3] and licence duties, coincided with a fall in beer consumption which was felt all over the country, but most of all in central London,

[1] This estimate is a guess, based on scraps of information about the number of houses owned by different firms at dates near 1860; between 1869 and 1884 the number of brewer-owned licensed houses in London probably declined.

[2] Distillers' and wine merchants' loans were also available for fully licensed houses, but on a much smaller scale.

[3] Rates rose sharply after the Valuation of the Metropolis Act of 1869 (32 & 33 Vict. c. 67) which provided for quinquennial revaluations. This also affected the licence duty, which was based on rateable value.

whence the resident population had long been migrating to the newer suburbs. The average annual consumption of beer in Great Britain in 1878 was 33·6 gallons a head. By 1882 the figure had fallen to 29 gallons, and by 1886 to 27·9 gallons.[1] Therefore the publicans' turnover, and profits, fell, and they found it difficult to keep up the interest payments on their loans. More houses fell into the brewers' hands because of the insolvency of licensees,[2] and publicans resorted to more widespread giving of over measure (a practice known as the 'long pull') and to watering or mixing[3] the beer they sold in an effort to obtain more custom and a greater profit margin.[4]

For brewers the loan system was cheaper and administratively more convenient than the purchase of public houses. It was also the traditional method of financing the London retail trade, a factor of importance in a trade where tradition played so great a part as it did for the London brewers. They were accustomed to perform the part of bankers and mortgage companies to the trade, and such activities were mentioned in partnership deeds and deeds of incorporation. They were not accustomed to, or ready for, large-scale property ownership.

Before 1889 the money lent by Whitbread & Co. to publicans at 5 per cent. interest was approximately equal to the money deposited with the Company, and also receiving 5 per cent. interest; so that the only charge on

[1] Dr. G. B. Wilson, *Alcohol and the Nation*, pp. 332–3. The precise reasons for the fall in average consumption cannot be given; at the time it was generally blamed either on the depression, or on the Temperance Movement. The latter appears to have affected mainly provincial towns. As these figures are based either on materials used, or a 'standard' barrelage of pre-fermentation gravity of 5·5 per cent., the possibility of a weaker beer affecting the figures must also be considered. It was also suggested that emigration was changing the age-composition of the population and thus lessening average consumption. Whether London consumption fell in the same proportion as in the country as a whole cannot be discovered.

[2] In such cases the brewers usually took over the houses as mortgagees in possession, and the publicans did not go through the bankruptcy courts; for this reason, increased insolvency of licensees is barely noticeable in bankruptcy statistics, though it is very clear in brewery records.

[3] Neither practice was illegal until 1885. Mixing meant the addition of a weaker ale, obtained from a small brewer, to the ale sold, and was a breach of agreement in the case of a publican having a loan from one of the bigger brewers. Dilution, that is, the addition of water, was common in the retail porter trade. Until 1885, only the addition of substances which would increase the real or apparent strength of the beer were of interest to the authorities, because this meant defrauding the Excise. The big brewers always disliked any tampering with their product, but were powerless to prevent dilution or mixing so long as these were tolerated by the law.

[4] In 1886 the Excise began prosecutions for dilution of beer by London publicans under the Act (48 & 49 Vict. c. 51 s. 8) passed in the preceding year. The publicans then applied to the Brewers' Company for a reduction in the price of mild ale and porter, on the grounds that they had entered into their existing contracts on the understanding that they would be able to dilute their beer; and that the profit margin was insufficient. The Brewers' Company reduced the price of mild ale and porter to the retailers by 3*s.* a barrel in 1887, and agreed among themselves to call in the loan, and not take on the custom, of any retailer convicted of dilution or mixing (Guildhall MS. 5468, Brewers' Company Trade Committee Minutes, p. 166).

brewing profits from investment in the retail trade was for bad debts and the cost of administration. The former varied according to the state of trade, and the latter was small. Before 1900, even in the worst years, such a charge on brewing profits was seldom greater than 1 per cent. of the total amount loaned. After 1900 the percentage of insolvencies grew, so that Whitbread directors estimated that insolvent loans formed 28½ per cent. of the money on loan in 1903; 38¼ per cent. in 1907; 40½ per cent. in 1912.[1] Altogether, during the period 1901–14, the loan system cost Whitbread & Co. £538,277 out of income, £179,000 out of capital, and £127,627 from reserve,[2] making a total of £844,854. These figures show how impossible London retailers were finding it to meet obligations under the loan system, and that the system was in any case doomed.

Before 1889 public-house ownership, irrespective of the profits on the beer sold in the properties so owned, was a reasonably lucrative venture. The profit rental[3] was high; during the period 1871–81 Whitbread and Co. made an average annual net profit of 10 per cent. on the sum invested in public-house property, after allowing for depreciation and repairs. During the eighties the net profit from such properties dropped steadily, and the average from 1882 to 1888 was only 4·9 per cent. on the amount so invested. After 1890 Whitbread public-house property was in fact run at a loss, and so constituted a charge on brewing profits (Table I). The amount of such charge is obtained by deducting all expenses directly due to public-house ownership, such as repairs to licensed houses, licence duty paid by brewers for public houses they owned, depreciation, and, after 1904, contributions to the compensation levy. To the loss so incurred is added 4 per cent. on the amount of capital invested in such property, to cover interest due to debenture holders and others, from whom the capital was obtained. No account has been taken of the extra staff required to administer such properties.

It is true that these figures do not provide a satisfactory[4] index of the profitableness of public-house property as a whole, firstly because they include large charges for depreciation, necessary because of the high prices paid for public-house property during the period 1896–1902; and secondly, because the rent paid by the tenant of a 'tied' house was appreciably lower

[1] Whitbread papers, Profit and Loss Accounts, and book marked 'C. H. A. Statistics', pp. 12, 13, 15–16.

[2] Whitbread papers, Profit and Loss Accounts.

[3] The profit rental is the sum which remains after deducting rent payable where the property is a leasehold, from rent receivable from the licensee. These figures were calculated from Whitbread papers, General Ledger Private Accounts, and Partners Ledger Private Accounts.

[4] Whitbread papers, Profit and Loss Accounts, and barrelage figures, are the sources from which these statistics have been calculated. The barrelage figures used included free, draught, and bottled-beer trade.

TABLE I

Year	*Loss incurred as a percentage of gross profits*	*Charge per barrel sold*
	per cent.	*shillings*
1890	2·9	0·3
1891	7·6	0·7
1892	7·3	0·7
1893	6·3	0·7
1894	7·9	0·9
1895	10·7	1·2
1896	18·2	2·3
1897	21·3	2·6
1898	18·7	2·1
1899	19·2	1·9
1900	19·5	2·1
1901	16·1	1·8
1902	17·7	1·9
1903	16·7	1·8
1904	19·3	2·1
1905	17·0	1·8
1906	18·4	2·0
1907	24·1	2·8
1908	23·9	2·6
1909	26·1	2·9
1910	36·1	3·9
1911	34·0	3·4
1912	34·4	3·2
1913	26·2	1·9
1914	31·5	2·7

than that of a 'free' house, and in the latter case the repairs were the responsibility of the tenant. But the incidence of depreciation, or the spread of a heavy capital loss, would have applied to anyone who purchased property after 1895, whether investor or 'free' tenant. On the second point, though 'tied' rents were a little lower than 'free' rents in many cases, the 'wet' rent system did not extend to London before 1903, and tied and free tenants received the same rates of discount, so that the difference in profit rentals was probably not so important as the responsibility for repairs. It appears therefore that public-house property was not very profitable for either the general investor or the free tenant at this period, as the breakdown of the loan system shows.

It is thus clear that the continuance of the loan system of financing the retail trade would have been impossible during the early years of the twentieth century, because of the high percentage of bad debts, indicating that licensees were unable in very many cases to make a reasonable profit; and that after 1890, when London brewers first began deliberately to acquire public-house properties, these were no longer a profitable invest-

ment; so that the ownership of the retail outlets of the trade by the brewers had in fact become financially necessary for the retail trade in London.

From the brewers' point of view the loan system also began to prove less satisfactory in the eighteen-eighties than it had previously done. Brewers found themselves compelled to raise very much larger sums to lend on mortgage to publicans in order to obtain the same amount of trade; their business was brewing, not money-lending, and they resented the increased risk which did not bring in a proportional return. The loans were increased on the same houses at every 'change'[1] and the capital profits from the increased value of public houses went of course to the outgoing licensees, not to the brewers, while the brewers took perhaps 90 per cent. of the capital risk.

The great increase in the loans made to publicans was a very important factor in brewers' capital requirements in the latter half of the nineteenth century. The increased capital required can be seen from Whitbread records. Whitbread & Co. sold slightly less beer in 1879 than they had done in 1869, but loans to publicans had grown from £450,000 to £600,000, an increase of 33⅓ per cent.[2] This occurred despite a growth of bottled-beer trade which was mostly free, and despite attempts to limit the increase in loans. By 1889, Whitbread & Co.'s sales were one-third greater than in 1879, but loans had increased during that period by half. In the East Ledger of Whitbread & Co.,[3] in 1869, 20 beerhouse-keepers had borrowed £3,117 (an average of £155 each), and 207 publicans had borrowed £282,678 (an average of £1,400 each). By 1888, in the same ledger, and in very many cases on the same properties, 24 beerhouse-keepers had borrowed £12,243 (an average of £500 each), and 201 publicans had borrowed £578,756 (an average of £2,890 each).[4] This increase was felt by all firms, and attempts were made by the Brewers' Company to stem the rise by limiting competition in loans. By 1890 it seemed that such measures might have some effect, but by this time some brewers had lost confidence in the loan system.

Apart from their reluctance to increase their investment in the retail

[1] A 'change' was the sale by the existing licensee of the lease and goodwill of the premises to another man, to whom, normally, the justices would transfer the licence. The incoming licensee obtained the greater part of the price of the lease from the brewers with whom he proposed to deal; and so, in some quarters, brewers' readiness to make large loans was blamed for the rise in public-house prices. In the eighteen-eighties, a 'change' was said to take place on average in London about every five years.

[2] Whitbread papers, Rest books.

[3] Ibid. At this time all Whitbread's town trade was divided into two areas, East and West, and details entered under those ledger headings in the Rest books.

[4] It will be noted that there is very little change in the total number of customers in the area between 1869 and 1888; rough minute sheets in the Rest books show that the firm's consistent policy was only to provide sufficient capital for such extra loans as were needed to maintain existing trade; the rise in sales came from 'free' trade.

trade without a commensurate increase in their sales, the brewers had other reasons to doubt the continued efficacy of the loan system. Since the reduction in the wholesale price of beer made in 1887, relations between brewers and licensees had not been too cordial, because the licensees resented the brewers' action in refusing to make, or continue, a loan to a licensee convicted of diluting or mixing beer. Licensees found that alternative sources of loans, not carrying a brewers' tie, were available. This was possible in two ways. The first was the development of a system of 'Vendor's mortgages' whereby the outgoing licensee left the greater part of the purchase price on loan to the purchaser, so that the brewer, if approached at all, was only required to lend on second mortgage, with greatly increased risk and less trade.[1] The second system was the formation of a Mortgage Corporation to lend to publicans, without any requirement that they should tie themselves for the beer trade.[2] In addition to this the pale-ale brewers of Burton made some loans to London publicans, and began to supply them with mild ale as well as pale ale, leaving the London brewer to supply a larger loan and obtain only the dwindling porter trade.[3] The London brewers, therefore, found themselves faced with a situation where they were compelled to increase their investment in the retail trade, without commensurate increase in sales, with a steadily increasing risk, and in danger of being squeezed out of part of their market.

There was another event which tended to encourage the London brewers to consider seriously a policy of brewer-ownership of public houses. Towards the end of the eighties, a boom in public-house sales outside London was taking place. In many areas nearly all the licensed houses had belonged to brewers for a long time; nevertheless, there were still areas where most houses were free, and a number of free houses in all areas. About 1888 the decrease in the number of 'free' houses, and the exclusion of Burton beers from many tied houses which had formerly admitted them, compelled Burton brewers and others outside London to embark on widespread purchase of public houses in order to prevent a catastrophic fall in their sales,[4] and this must have caused London brewers to consider the question of public-house ownership very seriously.

According to the theory that brewer-ownership of the retail outlets of the trade was inevitable if the same outlets were limited in numbers, widespread purchase of tied houses should have followed the Act of 1869 which placed beerhouse licences under the Licensing justices.[5] In London such

[1] Guildhall MS. 5468, pp. 271–2, Brewers' Company Trade Committee Minutes.

[2] The Licensed Victuallers' Mortgage Association, Ltd., was formed in 1887 to do this; there also appears to have been a 'Brewers' Assets Corporation', formed about the same time for the purpose of syndicating public houses; see Guildhall MS. 5468, pp. 241, 251.

[3] Guildhall MS. 5468, pp. 271–2, Brewers' Company Trade Committee Minutes.

[4] *Economist*, 1890, 22 Feb., article on Allsopp incorporation.

[5] 32 & 33 Vict. c. 27. In 1830 an Act had been passed creating beerhouse licences for

was not the case. Until 1885 London brewers showed no interest in the ownership of public houses, and brewery records show on the contrary a continually diminishing number of houses in the brewers' hands between 1869 and 1885, probably because of the pressure of rising loans on capital available.[1] After 1884 a number of London breweries took advantage of the changes in the law of limited liability, and sought extra capital through incorporation, and the offer of debenture and other shares to the general public. This has been quoted both as a cause and as a result of the scramble for tied houses,[2] but London firms which became limited liability companies in the period 1884–90 were not concerned with obtaining capital for the purchase of public houses, but for making larger loans on mortgage to licensees to conserve their existing volume of trade.[3]

Mr. Edward North Buxton, of Messrs. Truman, Hanbury Buxton & Co. Ltd., told the Royal Commission on Liquor Licensing, on 29 June 1897:

'. . . a very great change has taken place in the last five years. Probably some one or two firms endeavoured to increase their trade at the expense of others. Naturally every company tries to protect itself, and at least to save its own trade, and any firms which had not done so in the last five years would certainly have gone to the wall.'[4]

That the new system had not attained any very considerable hold by 1892 is certain. A return[5] gives the following figures (Table II) for the number of public houses in each licensing district belonging to owners of two or more public houses. Thus just under 48 per cent. of the licensed houses in London belonged to owners of two or more houses, compared with 79·9 per cent. in Bedfordshire; 82·6 per cent. in Hertfordshire; and 71·5 per cent in Surrey. The London figure is even lower when the special circumstances of property ownership in London are considered; and brewer-ownership, responsible for the high percentages of most country areas, was unusually low in London. An analysis of the names of London owners gives a total of 2,023 licensed houses belonging to brewers in the London licensing district, and another 86 houses which

which an Excise fee was payable but which did not require a justices' licence. The aim of this was to break the brewers' control of the retail trade by ceasing to limit the retail outlets; it was not successful, and the policy was then reversed in 1869.

[1] This is confirmed by contemporary trade journals, brewery company reports, and modern pamphlets on the history of individual London firms.

[2] Dr. J. Baxter, *Organisation of the Brewing Industry* (a Ph.D. Econ. thesis, University of London) states that the peaks in limited-liability company formation among breweries coincide with the peaks for company formation as a whole.

[3] London firms incorporated during this period include Combe & Co., Reid & Co., Truman, Hanbury & Buxton, Meux, Watney & Co., Courage & Co., Whitbread & Co., and some smaller firms.

[4] Pp. 1898, xxxvi, Q. 35,010, Royal Commission on Liquor Licensing Laws, Evidence, vol. 3.

[5] Pp. 1892, lxviii, pp. 147 ff. Home Office Return of the owners of two or more public houses.

probably belonged to brewers; that is, not more than 2,109 licensed houses out of 7,196, 29·3 per cent., belonged to brewers. The proportion is not very much greater than at the beginning of the eighteen-nineties. Then, 1,820 licensed houses certainly, and a further 117 probably, belonged to brewers, 24·4 per cent. of the total.[1]

TABLE II

Licensing district	*Total number of licensed houses*	*Number belonging to owners of two or more licensed houses*
Blackheath	602	244
Finsbury	663	341
Holborn	318	129
Kensington	514	244
Newington	1,584	595
Paddington	141	33
Penge	36	7
St. George's, Hanover Sq.	205	68
St. James's	258	115
St. Margaret's	139	61
St. Marylebone	304	138
St. Pancras	368	206
Stoke Newington	22	4
Strand	183	88
Tower	1,859	1,173
TOTAL	7,196	3,446

A study of the changes between the two returns shows the following results (Table III), where the bigger London breweries are concerned. This table, including all central London firms of any size, shows a net increase in ownership of 129 houses. Part of this increase may well have been due to houses falling into brewers' hands through mortgagors' insolvencies; but in the case of both Watney & Co. and Whitbread & Co. the increase is accounted for by the purchase by those firms of small breweries with their licensed houses, and this may be true of some other firms. Thus the slow rise in the total number of houses owned by brewers between the two returns, the fact that such increase was not universal, and that the largest increases were due to purchase of other firms, and not to purchase of individual houses, suggests that brewers were tending towards a policy of purchase of public houses, or retention of those which fell into their hands, but that there was as yet nothing which could be called a

[1] Pp. 1890–1, lxviii, pp. 107 ff. Home Office Return of owners of two or more public houses. Returns were compiled from replies made by licensees to licensing justices, and difficulties arise in compiling precise figures owing to variations in names of owners given. Only two such returns were ever made.

'scramble' for public houses, no attempt by any one firm to invade the established markets of others and no undue fear of loss of markets among the London brewers.[1]

TABLE III

Brewery company	*Public houses in London owned in* 1890	1892	*Change*
Truman, Hanbury & Buxton	215	219	+4
Watney & Co.	167	243	+76
City of London Brewery Co.	157	147	−10
Taylor Walker & Co.	119	117	−2
Meux's Brewery Co.	101	105	+4
Hoare & Co.	83	81	−2
Lion Brewery Co.	82	78	−4
Young & Co.	79	64	−15
Combe & Co.	78	84	+6
Cannon Brewery Co.	76	70	−6
Courage & Co.	59	62	+3
Charrington & Co.	53	61	+8
Mann, Crossman & Paulin	54	84	+30
Smith Garrett & Co.	45	47	+2
Camden Brewery Co.	33	48	+15
Matthews & Canning	36	37	+1
New Westminster Brewery Co.	41	46	+5
Whitbread & Co.	42	53	+11
Barclay Perkins & Co.	36	38	+2

Further evidence to this effect can be drawn from the minutes of the Brewers' Company Trade Committee. The first mention of the possibility of a brewer wishing to purchase a public house occurs at a meeting held on 25 October 1889, when the following resolution was passed:

> That the purchase of all licensed houses in the Trade of any of those brewers conforming to the rules as to loans be prohibited, but that this do not apply to the purchase of a house by the supplying brewer.[2]

and the meeting also discussed the fact that the supplying brewer might not wish to purchase the house. Some years later there were complaints among London brewers of action in contravention of this rule, and some firms resigned from the Brewers' Company.

[1] Watney & Co. purchased Artillery Brewery, Westminster, belonging to Carter Wood & Co., in 1890 (W. P. Serocold, *The Story of Watney's*, p. 15). Whitbread & Co. purchased H. & V. Nicholl's Brewery, Lewisham, in 1891 (Whitbread papers, book marked 'C. H. A. Statistics', p. 13).

[2] In 1889, the Brewers' Company had been unable to obtain the active consent of some members to proposed Loan Rules, and thus some firms were obeying the new rules as a temporary measure. In 1890 all members agreed to obey the rules and thus not to purchase houses in the trade of any firm belonging to the Brewers' Company.

By 1892, then, it would be true to say that the London brewers were dissatisfied with the loan system, but not prepared to go further than retaining in their hands properties of which they had become mortgagees in possession, perhaps to purchase a house already in their trade when the lease was sold by the licensee, if it appeared that they might otherwise lose the custom of that house; and perhaps to expand their trade through the purchase of another brewery complete with public houses. Such policy would gradually increase the number of houses owned by the brewers, but not at a rate which drove up prices (for a brewer himself bidding for a house would not also be offering a loan to a prospective licensee to bid against him), and not in a way by which the custom of the houses changed hands. It was this particular point on which London brewers felt, and had always felt, most strongly; financial pressure must not be used to cause a diversion of the trade of a house from one brewer to another.

However, the popularity of brewing shares with the general public made it easy for quite small companies to raise large loans by becoming incorporated, and offering mortgage debentures for subscription by the public. This enabled smaller breweries, not bound by the traditional trading ethics of the big brewery companies, to compete with the latter in a manner not hitherto possible. These smaller companies could either bid against the big company who supplied the house when the lease with possession came up for sale, or they could purchase, at a relatively small outlay, the reversion of an existing lease, providing they were prepared to wait some years before obtaining the trade of the house themselves. The reversion might even be purchased without the knowledge of the existing leaseholder, or supplying brewer. In 1903 the Cannon Brewery, who had been purchasing reversions for over ten years, was still waiting for the leases of 50 houses of which they held the reversions to fall in,[1] and in the meanwhile profit rentals on these houses were bringing in about 2¼ per cent. on the capital so invested. The purchase of reversions of houses in their trade, and the bidding against them for leases of houses they had hitherto supplied, compelled the bigger firms to take energetic steps to safeguard their existing outlets; and this drove prices up to 'boom' level. The period 1896–1902 saw London public houses change hands at fantastic prices, quite out of proportion to the value of the premises, or the trade done therein.

It has been alleged that the tied-house system spread to London as a result of the activities of country brewers.[2] This was not so. The number of public houses in London owned by country brewers in 1890 and 1892

[1] *Statist*, 14 Feb. 1903, p. 368, report of the annual general meeting of the Cannon Brewery Co. on 9 Feb. 1903.

[2] Dr. J. Baxter, *Organisation of the Brewing Industry*, p. 240, Ph.D. Econ. thesis, London University, 1945.

was 54 and 45 respectively, according to the Home Office Returns.[1] All except one of these firms were on the suburban fringes of London, and the houses were often in licensing districts adjacent to their own suburban localities. The exception was a Burton firm who had had a large London trade since 1850, whose relationship with the London brewers was friendly, and who is not likely to have bought London property on a large scale. Country brewers may have given indirect stimulus to the supersession of the loan system by subscribing to a corporation to supply loans to licensees free of a brewer's tie[2] or pale-ale brewers from Burton or Kent may have obtained mild-ale as well as pale-ale trade from London publicans, but the evidence does not allow the contention that country brewers were primarily or directly responsible for the spread of the tied-house system in London.

The rise in prices of public houses in London became really alarming in 1896; but so much money was available for investment at low rates of interest to any brewery company who chose to seek it, and competition was so great that nothing could be done. The Brewers' Company, to which in theory all London brewers should have belonged, at this period represented only some nine brewing firms,[3] and there is no sign that these were unanimous in the policy to be pursued. The Company, which had hitherto been able to limit competition between the bigger firms to one of quality alone, was thus powerless to deal effectively with frenzied competition for retail outlets, or to meet the attack of the new type of business man thrown up by the new limited-liability companies; and had to submit with its members to all the disadvantages of practically unlimited competition. The old tradition did not die, however; the nine firms retaining their membership of the Company obtained their tied houses either through insolvencies of licensees, or the purchase of houses already in their trade; or through the purchase of smaller breweries complete with the tied houses they owned.[4] All these big firms pursued a cautious financial policy, and managed to maintain themselves under the new conditions, though not without difficulty.

[1] Pp. 1890–1, lxviii. 107 ff. and Pp. 1892, lxviii. 147 ff. Home Office Returns on the owners of two or more public houses.

[2] There is no proof that this was done by the country brewers; but an increase in the number of 'free' houses in London might have been attractive to them; hence it is quite possible that they did support such a corporation.

[3] Guildhall MS. 5472; Brewers' Company Quarterage Account book, 1843–99.

[4] When these small breweries were in the suburbs, as was often the case, such purchases represented an extension of trade. At this date sales of small breweries appear to have usually been due to the deaths of partners; after 1910 such sales were usually due to financial strain connected with the purchase or running of tied houses. A brewery might have obtained a higher price for the houses sold individually; but legal difficulties of tie contracts, and unsaleability of stocks, buildings, and plant on their own, made sale of the whole business preferable.

There are no statistics to indicate how many public houses became brewers' property between 1896 and 1902, when the 'boom' began to wane. About 2,100 out of 7,100 houses in London belonged to the brewers in 1892; the rate at which such houses had come into brewers' hands 1890–2 was of 2·45 per cent. of the total annually. By 1896, if the rate had remained unchanged, about 2,800 licensed houses would have been brewer-owned, and some 4,300 owned by licensees. The amount of money still on loan to publicans in 1903 by brewers suggests that at least 1,300 of these, perhaps more, were either 'free' or tied to their brewer through the loan system. Such a figure would give the average number of houses purchased by brewers, 1895–1902, as not more than 500 a year.[1]

The growing importance to brewery companies of the sums required to finance the retail trade, never small, and the change of emphasis between the two systems, are well mirrored in Whitbread & Co.'s papers. Loans continued to increase and passed the million pound mark in 1890–1 (when licensed properties owned by the firm were worth only £100,000), and the two million pound mark in 1897–8. Licensed property owned reached the two million pound mark in 1907.[2] A few extra loans came with the purchase of other breweries, five in number, with total sales of 110,000 barrels, between 1891 and 1902, but as with one exception all were in the suburbs where the tied-house system had been adopted earlier than in central London, few loans were taken over in this way. Some idea of the strain placed on brewery capital can be seen from the following table, which gives the amount of capital invested by Whitbread & Co. in the retail trade (including both loans and properties as valued on the balance sheets) per barrel of beer sold, and, from 1897, the proportion of tied trade obtained through the loan system (Table IV). Whitbread figures for investment in the retail trade per barrel produced are considerably reduced towards the end of the period by the large 'free' bottled-beer trade of this firm, an advantage not possessed by other large London firms; by 1914, Whitbread's bottled beer sales amount to 58 per cent. of their total sales. The figures are also reduced by the annual amounts set aside for depreciation.[3]

[1] These suppositions are based on the Home Office returns already quoted, and information about the amount of loans and free trade in Whitbread papers. Round figures only have been used, and refer to the London licensing district, not the London Excise collection. In 1904 there was a total of 7,536 licensed houses, including hotels in London.

[2] Whitbread's did not begin to purchase houses in 1890, but after 1886 retained those of which they became mortgagees in possession. In 1896 they calculated that by buying a brewery company complete with houses they obtained £17 per month of trade for every £1,000 invested; buying houses individually would bring in only £10 in trade for every £1,000 invested.

[3] Whitbread papers, Rest books, barrelage, and book marked 'C. H. A. Statistics', are the sources from which the above figures were calculated. Trade figures for different types of trade—loan, tied, free—are not available before 1897. During this same period another

The rise in capital required necessitated incorporation as Limited Companies if this had not been done, and the raising of extra capital by those firms which were already incorporated. Whitbread & Co. increased their capital in 1895, 1897, 1899, 1901, 1904, to finance this investment.

TABLE IV

Year	*Amount invested per barrel sold*	*'Loan' trade as a percentage of total tied trade*
	£	*per cent.*
1885	2·36	..
1886	2·67	..
1887	2·54	..
1888	2·48	..
1889	2·73	..
1890	3·75	..
1891	3·88	..
1892	3·52	..
1893	3·64	..
1894	3·65	..
1895	3·90	..
1896	3·11	..
1897	4·73	17·3
1898	4·45	14·4
1899	4·39	13·1
1900	5·01	10·7
1901	4·97	10·1
1902	4·86	8·3
1903	4·83	8·3
1904	4·78	7·5
1905	4·66	7·4

By 1903 public-house values had fallen heavily,[1] and as this represented a real capital loss on properties purchased at inflated prices, brewery companies began to put all the money they could spare into depreciating the values of such properties in their books.

They also found that their purchases had had an adverse effect on public opinion. Ever since the middle of the nineteenth century there had been a strong movement, supported by the licensed trade and the brewers, to reduce the number of licensed houses in the country. But this movement had repeatedly foundered on the question of compensation to licensees the renewal of whose licences were refused on grounds of redundancy. Extreme

large London firm increased its investment in the retail trade by over 200 per cent., while sales only rose by just over 5 per cent., because they delayed acquisition of licensed property until after 1896.

[1] *Statist*, 13 June 1903, p. 1284; 'The brewers as a whole, and some individual concerns in particular, have incurred a rather heavy penalty for their extravagant competition with one another, and nothing approaching the prices paid some five or six years ago could possibly be obtained for the same houses if offered again for sale.'

teetotallers refused to have anything to do with any measure allowing such compensation, while most people felt it was an injustice to refuse compensation, when the 'monopoly-value' of licensed premises was recognized by the state when computing legacy or death duties. The matter had come to a head when the *Sharp* v. *Wakefield* case was taken to the House of Lords, where it was decided that, except where the law specified otherwise, licensing justices had the right to refuse to renew a licence on grounds of redundancy,[1] and of course no compensation was payable. Legislation introduced into the House of Commons at this time resulted in the passing of a Budget which placed an extra threepence tax on every barrel of beer, to be paid into a fund to purchase and abolish licences; and at the same time, the rejection of the Bill which would have enabled the fund to be used! A Royal Commission on the Liquor Licensing Laws was then set up, and after its report, the Balfour Government passed the 1904 Licensing Act.[2] This Act created a compensation fund from levies to be made on publicans in each licensing area, from which fund compensation was to be paid to the owners of licences which were abolished.

The effect of the new brewer-ownership of licensed houses on public opinion was that the name 'Brewers' Endowment Act', coined by the temperance members of the Liberal opposition, came into current use as a nickname for the 1904 Licensing Act. Sympathy, which had been widespread for individual licensees threatened with loss of savings as well as loss of their livelihood, was not extended to the new owners, the Brewery companies.

The compensation levy added to the expense of running licensed property, and hence tended to decrease its market value. In order that it should be paid by brewers, and not by licensees, tenancies-at-will took the place of the long leaseholds hitherto granted by London brewers.

When, in 1906, the Liberal party, supported by the Temperance Movement, came to power, they immediately sought to introduce a new licensing bill, setting a time limit, after which all licensed property would have lost its monopoly value; owners of licensed property therefore would have to write off the whole monopoly value out of income in the intervening period. This bill did not pass the House of Lords. The Government then decided to attain the same end through taxation; and an enormous increase of licence duty, to half the annual rateable value of the public house, was included in the Budget of 1909. This Budget was rejected by the House of Lords, but became law in 1910 as the Finance (1909–10) Act 1910.[3]

[1] Ap. Cas 173, and *Lords' Journal*, 20 Mar. 1891. The law, that is, the Wine and Beerhouse Act of 1869, specified otherwise in the case of beerhouses whose licences had been granted before 1869, the refusal to renew whose licences could only be made on certain grounds, not including the ground of redundancy.

[2] 3 Edw. VII, c. 23.

[3] 10 Edw. VII, c. 8, s. 44, subsection 1.

Thus, while most brewery companies were still struggling to depreciate the book value of their licensed properties to something approaching their real worth, the Government began to attack them in a manner to which they were particularly vulnerable at that time. The 1910 Act meant further depreciation in values of licensed houses, owing to the big fall, consequent on such taxation, in the net profit which could be expected to be made by them. Such depreciation could not be achieved out of current profits. It was in some cases done by capital reduction, in others by using reserves to write down values; in nearly all cases of London companies with public house property, it meant a cessation of ordinary dividends for many years. In 1911–12, out of twelve London breweries mentioned in the *Statist*,[1] only six paid an ordinary dividend, and in all cases the rate of the dividend paid was very low.

This of course affected ordinary share values, where the shares were quoted on the stock markets. But relatively few of the ordinary shares of London brewery companies were in fact quoted on the Stock Exchange, as the shares were held by former partners or their families, and often arrangements had been made that such shares should, like partnership shares, retain their par value, and be sold only to directors.

The big companies survived; the smaller ones did not. Nearly all the big companies had to reduce their capital. In some cases this was done as soon as the fall in the value of licensed properties after 1903 became apparent; in others, such depreciation could be made out of income, and the capital reorganization was postponed until it became clear that the Government would take action which would reduce values still further. Watney, Combe, Reid & Co. Ltd., the giant combine of the London industry at the time, with a capital of nearly £15 million created through the amalgamation in 1898 of three large firms, had prepared for the worst by reducing their capital by £2,389,057, and they found no further reduction necessary, though the price of their ordinary shares fell heavily and for many years they were able to pay no dividend at all. Truman, Hanbury & Buxton Ltd. reduced their capital by £1 million. Barclay Perkins & Co. Ltd. waited till 1912 to reduce their capital by £2,089,800. The Cannon Brewery, Hoare & Co. Ltd., Huggins & Co. Ltd., and Noakes & Co. Ltd., all smaller firms, reduced their capital by £650,000, £801,500, £632,000, and £228,000 respectively. All these firms were London brewers. The provincial firms did not escape; but their plight was less urgent, as their purchases of public house property had taken place earlier, at lower prices; they had had time to write down their property; and assessments, and therefore new licence duties, increased in the London area after the Finance (1909–10) Act 1910 by 205 per cent., were lower. The average

[1] *Statist*, 24 Aug. 1912, p. 503.

increase in licence duty for the country as a whole was of 114 per cent. Naturally therefore the burden was heavier on the London brewers.

The full results of these events were not seen until after the First World War; those companies who realized by 1912 that their financial position was permanently impaired waited, if they could, until the situation for the trade as a whole improved; and after 1918 obtained for their businesses prices commensurate with the nominal value, if not the real worth, of their original investment. This fact lies at the root of many of the purchases and amalgamations of the nineteen-twenties.

The difficulties in which brewery companies found themselves during the period 1902–10 were partly due to the prices at which licensed houses had been purchased after 1896. The purchase of the houses would however have been financially necessary to the retail trade in any case, and has resulted in great improvements. In the case of a large number of brewery companies, there was every sign that they would be able to meet out of income all their depreciation costs consequent on the 'boom'.

When, however, in addition to increased running costs of public houses and heavy depreciation charges, the Temperance party deliberately attempted to destroy the licensed trade through penal financial measures,[1] the position of brewery companies became very perilous; the bigger firms weathered the storm, but many of the smaller, though old-established and efficient, firms were in fact ruined.

Whitbread & Co. managed to pay an ordinary dividend, but only of 2 per cent., from 1908 to 1910, after reducing their ordinary capital; and of ½ per cent. from 1911 to 1914. Other companies found the situation just as difficult. Hodgson's Kingston Brewery Co. Ltd., of Surrey, reckoned that whereas in 1899 44 per cent. of total earnings had been paid to the Government, in 1910 60 per cent. was so paid—and without any change in the price of beer to the public. In 1911 a number of brewery companies made public the amount they paid in taxation; after making allowance for bad debts and depreciation, but before provision for interest, dividends, reserve, or compensation levy, Charrington & Co. Ltd. paid 70 per cent. of their profits to the State, as did Barclay Perkins & Co. Ltd. The Colchester Brewing Co. Ltd. calculated that they paid 82½ per cent. of such profit to the State.

Thus, though the 'boom' and subsequent heavy capital loss were due to competition between London brewers, the growth of the tied-house system in London was due to factors outside their control, and the Brewery Companies' dire financial straits after 1910 were directly attributable to government action.

[1] This intention is apparent from speeches made by Liberals at the time.

INSURANCE COMPANIES AND THE FINANCE OF INDUSTRY[1]

By G. CLAYTON *and* W. T. OSBORN

I. Introduction

IT is generally assumed that institutional investment in British industry has greatly expanded since 1939, but little detailed factual information is available. This article seeks to fill part of this gap so far as the insurance companies are concerned. The growth of insurance funds and their use as a channel for industrial investment is shown in Table I. The aggregate balance sheet values of industrial capital (debentures, preference and ordinary shares) held by insurance companies has risen from £596 million in 1937 to £701 million in 1946 and £1,675 million in 1955. An analysis of these increases shows that ordinary capital accounted for about half the increase both before and after the Second World War and that the annual increase is now more than three times as great as pre-war. By contrast the annual value of new capital issues by industry is less than twice its pre-war level.

TABLE I

New Issues and the Growth of Insurance Companies' Industrial Assets

(Annual averages in £m.)

	Increase in insurance companies' assets				*New issues*			
	Debt.	*Pref.*	*Ord.*	*Total*	*Debt.*	*Pref.*	*Ord.*	*Total*
1933–8 . .	..	..	..	..	35·5	21·5	41·9	98·9
1936–7 . .	11·1	11·6	22·8	45·5	..	..	..	..
1947–9 . .	3·0	15·0	33·0	51·0	27·3	31·9	70·6	129·8
1950–2 . .	47·3	6·5	38·5	92·3	52·4	11·6	65·0	129·0
1953–5 . .	64·3	23·6	93·3	181·2	73·1	18·4	90·7	182·2

Source Notes: New issues—Midland Bank data for calendar years, based on prices of issue for companies (excluding railway and gas and water undertakings).
Insurance companies' assets—Board of Trade data from balance sheets, for increase during the calendar year.

This rapid increase is a reflection partly of the growing accumulation of funds available for investment by the life assurance companies, and

[1] We gratefully acknowledge the assistance we have received from many people in this study, and especially from the Board of Trade, the insurance companies themselves, and the Rt. Hon. H. Graham White, whose generous financial assistance has greatly encouraged us.

partly of the modification of their long-established investment principles in favour of industrial securities. The scope of the insurance companies' activities and the principles governing their investments have been discussed in an earlier article.[1] It will, therefore, be sufficient here to mention two important factors.

First, funds for investment arise mainly from life assurance in which long-term contracts are involved; and the rate of premium is calculated on the assumption that part of the sum assured will be derived from interest earned on the fund accumulated during the currency of the policy. As is shown in Table II, the funds accumulated for general insurance are very much smaller, because the contract is usually an annual one and premiums and claims broadly speaking balance one another, a fund being accumulated only against unexpected contingencies. In fact total life funds have been growing by some £130 million a year since the war, and even more rapidly since 1952, while total general funds have risen only by about £30 million a year, and rather more slowly since 1952. No doubt the more rapid growth in life funds since 1952 is associated with the growth of pension fund business.

TABLE II

Accumulated Funds of Assurance Companies established in Great Britain (£m.)

Year	*Life and annuity funds (incl. industrial assurance)*	*General insurance funds*
1946	1,882	228
1947	1,995	268
1948	2,118	293
1949	2,244	343
1950	2,378	373
1951	2,511	407
1952	2,661	432
1953	2,865	454
1954	3,113	465
1955	3,374	492

Source: Annual Abstract of Statistics.

Secondly, the principles of investment have gradually been modified over a long period as a result of various influences. In 1862 Bailey gave formal expression to the principles which were to guide investment managers for half a century or more. For him the safety of the capital

[1] G. Clayton, 'The Role of the British Life Assurance Companies in the Capital Market', *Economic Journal*, vol. lxi (1951), p. 83.

sum was of greater importance than its yield and this emphasis caused him to look askance at all undated stock (even British Government securities) because they were liable to inconvenient fluctuations in capital value. His strong preference was for dated stock. From the beginning of its expansion in the middle of last century the British insurance industry has in fact always been willing to supply finance for industry in the form of debenture capital and, to a lesser extent, mortgages. The great extension of the joint-stock method of company organization after the First World War presented the companies with the opportunity of extending their holdings of ordinary shares. But at first not much advantage was taken of it because it was widely held that the tendency of ordinary shares to fluctuate in value conflicted with Bailey's principles. But about this time a small minority of actuaries (notably Raynes, Douglas, and Coutts) began to challenge the validity of these principles and to advocate investment in equities both to increase the income of the life funds and to avoid the effects of currency depreciation. More recently[1] Pegler and Clarke have put forward, as the first principle of investment, the maximization of the expected yield which Clarke defines to include that of capital security by taking into account not only the expectation (or probability) of receiving each item of income from an investment but also that of receiving back the capital. The implication is that income-cautious investors such as life assurance companies should give first priority to achieving a steady and increasing income in the future and should thus include ordinary shares in their portfolios.

One factor in this change of attitude has undoubtedly been the change in the nature of life assurance business. In Bailey's time it consisted almost entirely of ordinary whole life policies, so that the main objectives of investing the funds were to keep the capital value secure in order to meet the liabilities and to earn a rate of interest equal to that assumed in the calculation of premiums. Since the First World War, however, the life offices have increasingly emphasized the value of life policies as investments especially when they take the form of children's deferred assurances or contracts of the 'family protection' type or even simple with-profit endowment assurance policies. By thus offering the individual relief from the responsibilities of investment the insurance companies have to some extent accepted the functions of investment trusts. Consequently they have tended to become more anxious to earn high yields than to maintain the capital value of their funds. This trend has more recently been reinforced by the growth of pension fund business which has lengthened the average liability of life office funds.

Another major factor has already been mentioned—the depreciation of

[1] *Journal of Institute of Actuaries*, vol. lxxiv, p. 179, and vol. lxxx, p. 335.

the currency. In one sense this may be ignored, for insurance contracts are expressed in terms of money and a general decline in its value need not worry insurance companies. Nevertheless, in life assurance most companies have interpreted their obligations more widely than this and have at least tried to protect their with-profit policy-holders from the effects of inflation as far as possible. Even in general insurance business, where the liquidity and marketability of investments are more important considerations, rising prices cause a rise in the cost of claims and investment in equities is a hedge against this risk.

Yet another factor, especially since 1945, has been the desire of the insurance companies to reduce the size of their gilt-edged portfolios. These have been much greater than would normally be desired for two reasons. First, through a 'gentleman's agreement' with the Treasury in 1940 most of the funds accumulating during the war were invested in government securities. Secondly, as basic industries were nationalized in the immediate post-war years, mere strokes of the administrative pen transformed industrial investments into gilt-edged stock. Their desire to reduce the proportion of gilt-edged investments was reinforced by the considerable fluctuations in the capital values of this stock after the Daltonian episode. Consequently a traditional outlet for their money has been partially or wholly disregarded for most of the post-war period and other forms of investment including ordinary shares have been more popular. In fact, as a result of all these influences, the proportion of total assets held by British Life Offices in the form of ordinary shares grew steadily from 3 per cent. in 1922 to 10 per cent. in 1939. After the interruption caused by large-scale investment in British Government securities during the war, the trend has been resumed in the post-war period and the proportion in 1956 was 15½ per cent.

II. Analysis of Insurance Companies' Shareholdings in Industry

So far we have discussed the importance of investment in industry to the insurance companies as revealed by the aggregate figures of insurance companies' assets. The problem may also be considered from another angle. How important are the insurance companies as a source of funds to industry? In seeking an answer to this question it is possible to attempt a more detailed analysis by using the share registers of industrial companies. In order to confirm, if possible, our original assumption that insurance companies are the most important institutional investors, a full analysis of the share registers of seven companies specializing in the manufacture of commercial vehicles was undertaken. Such a sample is too small to be considered representative of industry in general, but it

had the advantage of a fairly homogeneous output and of the inclusion of firms of widely differing size. An analysis of all shareholders into seven classes of shareholders was made from the latest registers available in the middle of 1953, and the results (based on the nominal value of shares) are given in Table III.

TABLE III

Share Holdings in Seven Companies Specializing in Manufacture of Commercial Vehicles

	Ordinary shares		*Preference shares*	
	£th. nominal	%	*£th. nominal*	%
Insurance companies . .	629	11·2	894	31·7
Investment trusts . .	199	3·5	122	4·3
Banks	41	0·7	26	0·9
Other financial institutions .	339	6·0	218	7·7
Industrial companies . .	105	1·9	19	0·7
Nominees	633	11·2	150	5·3
Private persons . . .	3,696	65·5	1,391	49·3
	5,642	100	2,820	100

Source: Share registers mid-1953.

Although the sample was very small, the results give some indication of the relative importance of the different classes of shareholders. They show that about two-thirds of the ordinary shares were owned by private persons and that of the institutional holders insurance companies were by far the most important. The holdings of the insurance companies represented about 11 per cent. of the equity of the companies in this sample, which is shown by the fuller analysis described below to be greater than their equity holdings in industrial companies in general. The holdings of all other institutions were together only slightly greater than those of insurance companies. Insurance companies' holdings of preference shares represented about a third of the total and those by private persons about a half.

Another group of holdings identified here is that of 'nominees'. It has been suggested[1] that insurance companies normally register their holdings of ordinary capital directly in their own names. Nevertheless, in our main analysis certain insurance companies were conspicuous by their absence from the lists, although their balance sheets show that ordinary shares form an unusually large proportion of total assets. Inquiry has revealed that a few insurance companies do use nominees quite extensively, but there is no reason to believe that this practice is widespread or important enough to invalidate our analysis.

[1] Hargreaves Parkinson, *The Ownership of Industry*, 1951.

Encouraged by this slight but definite evidence of the insurance companies' importance as a source of funds we undertook an analysis of their holdings alone in a much larger sample of industrial companies. We chose one of over 300 companies which, as one of our main purposes was to discover some indication of the extent to which companies of various sizes were able to attract insurance companies as shareholders, were stratified according to size. The population was taken to be all those companies registered in Great Britain with any class of capital quoted on any Stock Exchange in Great Britain and with an entry in the Stock Exchange Year Book in the following sections—Breweries; Iron, Coal, and Steel; Oil; Shipping; and Commercial and Industrial. Subsidiary companies were omitted unless either the parent company held less than 75 per cent. of the ordinary capital or the parent company was not a member of the population of companies as defined above.[1]

All companies in this population were classified according to size, measured by net assets (defined as fixed assets plus net current assets).[2] The sample was then selected systematically and consisted of all companies with net assets of £15 million and over; one in five of those with net assets of £5 million and less than £15 million; one in ten of those with net assets of £1 million and less than £5 million; and one in fifteen of those with net assets of less than £1 million. The composition of the sample with the estimate of total assets is given in Table IV.

TABLE IV

Sample of Industrial Companies

Size of company	*No. of companies*		*Net assets (£m.)*	
	Sample	*Population*	*Sample*	*Population, est.*
A. Over £15m. . . .	71	71	3,287	3,287
B. £5m. and under £15m. .	34	170	273	1,366
C. £1m. and under £5m. .	72	720	155	1,549
D. Under £1m. . . .	149	2,235	51	761
Total	326	*c.* 3,200	3,766	*c.* 6,960

Source: Stock Exchange Year Book.

There are many aspects from which our sample might well be shown to be unbalanced and our definition of the population inevitably gives rise to some anomalies. There are some companies, for example, which we include because they are registered in this country and quoted on a

[1] 'Subsidiaries' of the Iron and Steel Holding and Realization Agency were included.

[2] These were calculated from the summary accounts given in the Stock Exchange Year Book, most of which related to dates in 1953 and 1954. Where no accounts were given, the total issued capital was usually taken as a measure of size.

British Stock Exchange, although their main sphere of activity is overseas.[1] There are other very important companies in British industry which are still private companies (e.g. Pilkington Bros.) or are not quoted (e.g. Esso Petroleum Co. Ltd.). The measure of size by net assets, too, is not unambiguous and the categories of size are therefore by no means well defined. But a rough and ready check[2] shows that the industrial coverage is reasonable in that the sample reflects the industrial pattern of British industry and it is thought that in most important respects the picture revealed is a representative one.

After the selection of the sample the analysis of share registers was carried out as follows. Between mid-1955 and mid-1956 the latest available share registers of the sample companies were inspected at the Board of Trade's Companies Registration Offices in London and Edinburgh. The task of extracting the detailed holdings of some 280 insurance companies (as listed in the publications of the Board of Trade) was completely beyond our resources for a sample of this size. However, as was explained above, it is the life assurance companies which provide by far the greater proportion of the investible funds, and so our main analysis is confined to the holdings of some eighty insurance companies (about fifteen of them being subsidiaries) which conduct life assurance business and which have total assets exceeding £1 million each. As most composite offices do not separate their funds for the purpose of investment, the funds of those eighty companies include a considerable proportion of total non-life funds as well. The validity of this procedure was checked by extracting a full list of all insurance companies' holdings for a limited number of share registers (including some of the largest). These showed that the holdings of the purely non-life insurance companies are small in number and size by comparison with those of the life companies.

In aggregating the data nominal value has been used, although it is likely that a rather different picture would have emerged if it had been possible to use market value or cost. Where aggregates are quoted, they will in general be given as estimates of the *population* aggregates—i.e. the *sample* values will be scaled up to give a true perspective. Wherever possible, the latest issues of the registers were used and for the majority these were for the years 1954 and 1955. But in a few cases reference was made to the registers for 1953 or for 1956. Such a staggered basis is one of the inevitable disadvantages of our method.

The summarized results are shown in Table V, which gives the percentage of issued ordinary capital held by insurance companies. For all

[1] For example, Trinidad Petroleum Development Co. Ltd. and West Canadian Collieries Ltd.

[2] In particular, by comparison with 'A Classified List of Large Companies Engaged in British Industry' (1955), by N.I.E.S.R.

industrial companies the percentage is estimated as 6; for medium-sized companies (between £1 million and £50 million net assets) it is a little higher, for the giants (net assets of more than £50 million) only 5 per cent., and for the small companies (net assets under £1 million) 3½ per cent.

TABLE V

Ordinary Capital

Size group	*No. of companies*	*Total ordinary capital issued (£m. nominal)*	*Held by insurance companies (£m.)*	%
A_1. £50m. and over . .	15	611	30·7	5 | 6
A_2. £15m. and under £50m.	56	481	35·0	7½ |
B. £5m. and under £15m.	170	576	39·0	7
C. £1m. and under £5m. .	720	512	33·1	6½
D. Under £1m. . .	2,235	440	15·8	3½
Total . . .	3,196	2,620	153·7	6

Source: Share registers 1955–6.

Of the largest companies (seventy-one with net assets of more than £15 million) there were only three in which the major insurance companies taken together held more than 15 per cent. of their ordinary shares and two of these were iron and steel companies whose shares had recently been sold to the public by the Iron and Steel Holding and Realization Agency. At the other end of the scale there were only nine for which the proportion was below 1 per cent.

Of the 149 companies in the sample with net assets under £1 million there were 5 in which the total of insurance companies' holdings were above 15 per cent., but 86 in which they had no holdings at all.

Two major conclusions may be drawn from this analysis. First, it is clear that insurance companies not unnaturally have a preference for the more readily marketable shares of the larger industrial companies. Secondly, taking industry as a whole the insurance companies are not yet as dominant as has been widely assumed nor even as our small preliminary analysis suggested. But such a conclusion would need modification if there were any evidence that their holdings were increasing as a proportion of the total. It seems reasonable to expect that such a trend would be first revealed among companies making new issues of ordinary shares in which the insurance companies (with substantial new funds to invest) might be expected to absorb a larger share than they previously had held.

To test this hypothesis, a study was made of the share registers of all

those companies shown in the Times Issuing House Yearbook to have issued ordinary capital in the year 1954–5 to the nominal value of £1 million or more. Of these, six were offers for sale by the Iron and Steel Holding and Realization Agency, and in all these cases the insurance companies took up a substantial amount, holding some 16 per cent. after the offer. There were only six other issues for cash—all being 'rights' issues—and of these on the average insurance companies took rather more than their original share, so that their combined holding rose from 6 to 7½ per cent. The vast majority of new issues in this year both by number and value were bonus issues for the capitalization of reserves (some 65 of them over £1 million nominal). The aggregate results even of these companies show a small increase in the percentage of ordinary capital held by insurance companies (but only by less than ½ per cent.).

This evidence suggests that there has been a definite increase in the proportionate share of insurance companies in those cases where there has been a major issue of new ordinary capital, but that this increase is less striking than might have been expected. For that particular year, it is clear that a large amount of the new funds of insurance companies was channelled into the purchase of iron and steel shares. A similar analysis of the share registers of companies which issued ordinary capital in 1956, however, showed a similar conclusion. For over twenty companies whose new issues in that year involved more than £1 million capital subscribed for cash, the average insurance company holding rose only from 14·3 to 14·6 per cent. While their interest in these companies is clearly greater than the average of 6 per cent. revealed by our earlier analysis, the *increase* is too small to confirm our hypothesis that the importance of insurance companies is growing very rapidly through their activities in the new issue market.

Another aspect which merits more detailed analysis is the degree of potential control which the insurance companies may exercise as shareholders. The important point here is the degree of concentration of their holdings, for the threat of domination would be greatly increased if a holding of, say, 6 per cent. were mainly concentrated in the hands of a single insurance company. For this purpose we noted both the number of insurance companies holding shares in each of our sample companies and the size of the largest holding among them. In the largest companies (group A) we found that the average number of insurance companies with holdings was 32; in group B (net assets £5 million–£15 million) the average was 17, in group C (net assets £1 million–£5 million) it was 6; and in group D (net assets under £1 million) it was only 1·3. The largest individual holding exceeded 5 per cent. in only a very few cases. Not unexpectedly the Prudential Assurance Company was in many cases the

largest insurance company shareholder—in 37 of the 71 firms in group A; 13 of the 34 in group B; 26 of the 72 in group C; and 19 of the 149 in group D. There is little doubt that in many of these cases the insurance companies, if they chose to act as a small coherent group, could exercise a far greater degree of control than the figures suggest. Professor Lionel Penrose has pointed out[1] that such a group with a minority of votes can normally obtain the decision they want against an unorganized crowd of individuals with even a large majority of votes in aggregate, if the individuals are indifferent and it is a matter of chance, if they vote at all, which way they vote. But there is no evidence to show that the insurance companies have attempted to exercise control either collectively or individually; such evidence as there is reveals rather a desire to avoid at all costs the responsibilities of control.[2] They rarely have any knowledge of the extent of each other's holdings and many of them individually have an unwritten law that in no circumstances must they acquire more than a small percentage of the equity of any one company. In most cases the figure is fixed as low as 2 per cent.[3] in order to avoid all possibility of becoming a dominant shareholder.

TABLE VI

Preference Capital

Size group	*Estimated no. of stocks*	*Total preference capital issued (£m. nominal)*	*Held by insurance companies (£m.)*	%
A_1. £50m. and over . .	30	187	15·9	8½
A_2. £15m. and under £50m.	93	181	23·9	13
B. £5m. and under £15m.	235	229	35·0	15½
C. £1m. and under £5m. .	820	232	39·6	17
D. Under £1m. . . .	1,725	190	16·3	8½
Total . . .	2,903	1,019	130·9	13

Source: Share registers 1955–6.

The pattern of insurance companies' holdings of preference shares is very similar, and is shown in Table VI. In aggregate, insurance companies hold some 13 per cent. of all preference capital, but their importance is clearly greater in the medium-sized companies than in either the largest or the smallest. It would seem also that insurance companies are ready to hold a larger proportion of available preference capital than of equities,

[1] *J.R.S.S.*, vol. cix, pt. i, 1946, p. 54.

[2] The intervention of the Prudential Assurance Company at a recent Annual General Meeting of B.S.A. seems to be a definite exception to the rule.

[3] For one or two of the larger companies the figure is 5 per cent.

a fact which reflects mainly the more limited amount of preference capital in issue, and also the emphasis placed by insurance companies on security of income and on avoiding control. It can be seen from the table that the 71 largest companies had no less than 123 preference stocks in issue, while the 149 small companies in the sample had only 115 in issue. The suggestion that insurance companies found many of these smaller companies unattractive is illustrated by the fact that, among the 123 preference stocks of the larger companies, insurance companies had some holdings in all but 6; while at the other end of the scale as many as 66 of the 115 stocks of the smallest companies had no insurance company holdings.

Preference stocks are attractive to insurance companies provided that the rate of interest is high, and the security good. It is clear that the smaller companies find difficulty in meeting these requirements, and in any case are reluctant to commit themselves to high interest rates for extended periods in the future.

III. Conclusion

The results of the analyses described above show the importance of insurance companies as investors in preference and ordinary shares. Their interest in the latter which first emerged in the twenties has now become a major factor in the market. Their policies are eclectic in so far as they prefer to invest in large and medium sized companies. It is not very often that they will be interested in the equity of a small company; and the inducements (including the quality of its management, its prospects and its stability) must be exceptionally attractive before they will do so. Even when they are prepared to supply money to a small company through preference shares or long-term loans, negotiations sometimes break down because they insist on provisions about redeemability which are not always convenient. In so far as they do invest in smaller companies, our study also shows that only the larger insurance companies are involved with any frequency.

The aggregates so far considered naturally conceal wide variations of practice among different insurance companies which may often be explained by particular historical developments. For example, the Norwich Union Life Assurance Co. has 48 per cent. of its assets in mortgages and only 6 per cent. in equities, while the corresponding figures for the Scottish Widows' Fund & Life Assurance Society are 5 per cent. and 35 per cent. The former, having a close connexion with the farming community in East Anglia, has developed an expertise in financing through mortgages which is exceptional among insurance companies. The latter's unusually large holdings of equities may be attributed to an early realization of the

great earning potential of equities and of the importance of a hedge against inflation.

Differences in the relative importance of the various types of insurance business undertaken by the companies also produce differences in their portfolios. The investment manager of a general insurance fund may need to convert assets into cash quickly and, therefore, prefers easily convertible stocks (such as dated gilt-edged stock) to ordinary shares. On the other hand the investment manager of a rapidly growing life fund with considerable liabilities in the form of with-profit policies will have more incentive to hold ordinary shares. Consequently purely life offices tend to hold a higher proportion of the latter than composite offices.

The proportion of equities in the portfolio of an insurance company does also appear to bear some relation to the size of that company. Broadly speaking, there is some tendency for the larger insurance companies to hold a smaller proportion, and for medium-sized companies to hold a larger proportion than the average. This inverse relation, however, is not valid for the smaller insurance companies (below some £5 million total assets), for many of these again hold a smaller proportion in equities than the average. This divergence between the practices of large and medium-sized firms may occur because the former are not able to buy as many ordinary shares as they would like and at the same time to satisfy the criteria of investment which seem to be generally applied. We have already discussed the unwritten law which almost all companies obey of not holding more than 2 per cent. or at the most 5 per cent. of any one industrial company's equity. In order to spread their risks as evenly as possible, they observe a second criterion whereby they avoid placing more than a very small proportion of their total funds in any one company. Thirdly, they prefer all their assets including equities to be easily 'saleable' and readily marketable. It is much easier for a medium or small insurance company to reconcile these different criteria and still hold as much as a third of its assets in ordinary shares distributed among say 400 separate industrial companies. But a very large company like the Prudential would find it impossible. The main obstacle is the strong desire to remain a minority shareholder.[1] Thus it is not surprising that the Prudential, although it has as many as 1,200 separate holdings in its equity portfolio (many of which cannot be described as readily marketable), has only 14 per cent. of its total assets in this category. The structure of the London new issue market accentuates the problem, for it has developed its machinery primarily to provide individual investors with small amounts of suitable securities. The large insurance companies at

[1] In our sample there are several small companies in which individual insurance companies have bigger holdings than 5 per cent.

present are investing between £5 million and £10 million a year in equities and are naturally anxious to buy large quantities of those particular new issues which they consider suitable for their purposes. They are often baulked in their intentions by the convention of the market whereby the larger applications are disproportionately scaled down whenever an issue is oversubscribed. The smaller the insurance company, the less restrictive is this particular practice.

One of the general implications of the importance of the insurance companies as investors in ordinary shares is that their general preferences and particular idiosyncrasies cannot be easily ignored by sellers. As major investors they may add to the stability of the market because (from the oral evidence given by the investment managers of a representative selection of companies) they generally buy equities to keep in their portfolio for their potential long-term earning power and not to make speculative short-term capital gains. If this means that they speculate according to their expectations of long-term gains, this will stabilize the market; but in so far as they invest their funds steadily as they accrue, it is possible the market will still be dominated by the short-term speculators.

Finally, both the insurance companies themselves and the market have been a little slow to adapt their attitudes and practices to the changed circumstances. With their funds growing at the present rate the former will find it increasingly difficult to steer clear of the Scylla of imperfectly marketable securities without running into the Charybdis of becoming an important shareholder. Of the two criteria the insistence on a high degree of marketability could be most easily modified, for the companies' need for liquidity is small. A growing company, which already has at its disposal supplies of excess cash from the increase in the total fund, may ensure that the liquidity of its assets is made doubly secure by arranging that a small proportion matures each year. Thus for the majority of their assets liquidity is a secondary factor compared with yield and security. We have already seen that despite their adherence to this criterion most companies do not consider the enforced resale of the majority of their equities to be more than a remote contingency. Furthermore the oligopolistic structure of the market is now such that, even where there is a good market in the particular shares, liquidity in the sense of realizability *without loss* is likely to prove illusory in so far as widespread sales by a company will tend to depress prices to its own disadvantage.

The relaxation of the unwritten rules about the percentage of shares held in any one company is a more difficult matter because it involves wider social and economic issues. Not least of these is the attitude of industry itself. In the future many companies (if they are to raise sufficient equity capital from the market) may have to accept the fact that

between 10 and 15 per cent. of their shares will be held by insurance companies. The only alternative may be to have a more highly geared capital structure and to raise the money through debentures and preference shares. At the moment the problem of domination by the insurance companies is more apparent than real because, as has been stressed, they are so obviously disinclined to interfere directly in management. Nevertheless, the issue has to be faced by both sides if an increasing amount of money is to be provided by the insurance companies for industry in the form of equities. A paradoxical by-product of the revision of these criteria would be an improvement in the new issue market's facilities for the flotation of small issues. Hitherto the difficulty has been that for an issue to be suitable for the general investor it must have long-run marketability which is mainly a function of size. But if one of the major institutions places less stress on this factor, the smallness of an issue will have less effect on its marketability.

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THE METHODOLOGY OF THE THEORY OF RETURNS TO SCALE

By DAVID SCHWARTZMAN

THE unpopularity of methodology among economists would be justified if their work were methodologically impeccable. Methodology may be tiresome, but so too are methodological errors. Writings in economics are not free of such errors, and an unfortunate consequence has been attention to false issues, particularly in the literature on the theory of returns to scale. This area will command most of our attention, but bad reasoning has not been confined to it, and examples of similar errors in other areas will be provided.

The muddle in the discussion of returns to scale may be illustrated by references to the writings of Samuelson, Hicks, and Chamberlin. Apparently the currently accepted theory implies that perfect divisibility of factors is accompanied by constant returns to scale. All three authors, however, believe that returns to scale may vary even under conditions of divisibility, and they therefore consider the theory to be inadequate.

Samuelson attributes the difficulty to the interpretation of 'factor'. If the term were restricted to mean only inputs of measurable economic goods and services, divisibility of factors would not imply constant returns.[1] It is astonishing that 'factor' has been taken to mean anything else. That Samuelson feels obliged to propose this restriction indicates to what a pretty pass we have come in this discussion.

To explain varying returns to scale under conditions of factor divisibility, Hicks introduces the special assumption that the firm has a 'fixed productive opportunity', which limits scale.[2] This assumption is a highly contrived solution for the problem of varying returns to scale.

Chamberlin maintains that any definition of indivisibility which is based on efficiency produces a tautological attempt to explain economies of scale. To state that a factor is indivisible when large units of the factor are more efficient than small units and then to infer economies of scale from factor indivisibility is circular reasoning according to Chamberlin.[3] Stigler also appears to be of the opinion that a tautology is implicit in any

[1] P. A. Samuelson, *Foundations of Economic Analysis* (Cambridge, Mass.: Harvard University Press, 1947), p. 84. Cited by R. G. D. Allen in 'The Mathematical Foundation of Economic Theory', *Quarterly Journal of Economics*, 1949, p. 116.

[2] J. R. Hicks, *Value and Capital* (Oxford University Press, 1946), p. 322. Quoted by Allen, loc. cit.

[3] E. H. Chamberlin, 'Proportionality, Divisibility, and Economics of Scale', *Quarterly Journal of Economics*, Feb. 1948. Reprinted in *The Theory of Monopolistic Competition* (Cambridge, Mass.: Harvard University Press, 1948, 6th ed.), appendix B, pp. 236–7.

argument based on indivisibility.[1] Nevertheless, his explanation of economies of scale rests on indivisibilities.

This essay will demonstrate that methodological errors have been responsible for the difficulties which have been cited. To determine the reasons for the vague interpretation of 'factor' requires such an analysis. I shall consider also whether the inference of constant returns from the assumption of factor divisibility is valid. The more general question of the relationship between inferences within a theory and the facts to which they refer will be treated as well. Finally, I shall consider whether a formal theory is necessarily tautological, and, if it is, whether it should be abandoned on this account. According to some writers, theories necessarily are tautological and may still provide a structure for empirical observation.[2]

I shall attend first to the methodological questions proper and then proceed to an analysis of the theory of returns to scale. In the concluding section I shall point out other areas in economic theory where similar errors have been frequent.

I. Methodological Issues[3]

The points to be made about the properties of formal theories and the problems of interpreting them will be illustrated by references to the theory of variable proportions. Writings on this theory have been more precise than those on returns to scale and there has been less disagreement between authors. Therefore, it provides an opportunity for a trial in applying methodological concepts without running into as many problems as arise in relation to the theory of returns to scale.

A formal theory explores the implications of a set of premisses. In such a theory the premisses are preceded by definitions, which in turn are preceded by a list of primitive terms. It is hoped that all inferences are valid and the desired conclusions can be drawn.

An example of what is meant by a formal theory is the theory of variable proportions. Consider the two-factor case. The premisses are: one factor is increased in quantity; the other is fixed in quantity; the variable factor is an imperfect substitute for the other in terms of output. And *ceteris paribus* the inference is: increments to the product eventually diminish with equal increments to the variable factor.

The theory defines the strategic terms, 'factor', 'imperfect substitute',

[1] George J. Stigler, *The Theory of Price* (New York: Macmillan, 1946), p. 202n. Cited by Chamberlin, loc. cit.

[2] A. N. McLeod and F. H. Hahn, 'Proportionality, Divisibility, and Economies of Scale: Two Comments', *Quarterly Journal of Economics*, 1949, pp. 128–37.

[3] I am grateful to Dr. Sidney Morgenbesser of the Department of Philosophy, Columbia University, for valuable advice about the questions which are discussed in this section.

and 'output'. 'Factor' is an economic good or service used by the firm in its production activities. A factor is a perfect substitute for another when it is possible for a unit of this factor to replace a unit of the other without affecting output. Any unit may be selected provided a unit of the alternative factor which is sufficiently large to produce the same output is also selected. When this relationship between factors does not exist they are 'imperfect substitutes'. 'Output' is defined as economic goods and services which result from the firm's production activities.

If the definitions of the terms are independent of the relationships described by the theory, as they are in the above statement of the theory of variable proportions, the theory is free from tautology. Thus factors are not defined as imperfect substitutes. Were the decision to distinguish between factors dependent on the degree of their substitutability, the theory would be tautological. Moreover, the example shows that a theory need not be tautological for inferences to be possible. This implies, however, that while inferences may be drawn correctly, they may not be true. In the example, the conclusion is only true if the factors are, in fact, imperfect substitutes.

It is clear also that if factors were defined to be imperfect substitutes the theory would not be of any value. Diminishing returns would be implicit in the definition, but the theory would be merely reciting a list of definitions without indicating anything about the nature of actual events. Gaps in the chain of substitution do not always correspond to observed groupings of men and things. Thus, when it is found that additions to a factor do not result in diminishing returns, it is contended that it is not truly a 'factor'. This is what is commonly known as defining away the problem.

Although a theory may be free from tautology, it may fail on other grounds. For a theory to contribute to the understanding of events it must be interpreted sufficiently for it to be testable. The data which are appropriate for testing should be indicated, and they should be available or conceivably obtainable. For the purpose of the economist, this means that a *ceteris paribus* premiss cannot be retained and must be replaced by a list of identifiable and measurable *cetera*. In addition, such words as 'eventually', as used in the theory of variable proportions, must be replaced by limits which permit a finite set of data to establish the acceptability of the conclusions. Other terms such as 'factor' and 'output' should be specified to the extent necessary to prevent ambiguity concerning what is to be included. Thus the usual statement of the theory of variable proportions must be amended considerably before it may be tested.

In the interpreted theory the analogues of the inferences in the uninterpreted formal theory do not follow from the analogues of the premisses with complete certainty. The list of specified *cetera* may not be sufficiently

exhaustive to warrant the desired conclusions. Similarly the conclusions no longer follow rigorously from the premisses when open-end terms, such as 'eventually', are eliminated. For these reasons an interpreted theory cannot claim to exhaust all possible explanations of the phenomenon in question. For example, increments to the variable factor may not be associated with diminishing marginal product owing to an unperceived change in the arts. Thus the advantage of the formal uninterpreted theory in providing logically correct inferences is lost in the process of interpretation.

II. The Theory of Returns to Scale

The main questions are these. (1) Is the indivisibility argument tautological? (2) Does the theory imply constant returns given divisibility of factors? I shall inquire as well why there has been some difficulty in the interpretation of 'factor'. Finally, I shall evaluate the indivisibility theory.

Indicative of the confusion is the absence of a precise statement of the theory. Instead statements have been made concerning the implications of indivisibility, such as the following by Mrs. Robinson:

> It remains to inquire how increases in efficiency can arise. They arise because the factors of production, in the world as we know it, consist of indivisible units, each of which is not equally well adapted to performing all the tasks required in production. If all the factors of production were finely divisible, like sand, it would be possible to produce the smallest output of any commodity with all the advantages of large-scale industry. But actually the factors consist of men (providing labour and entrepreneurship); money capital, which is finely divisible, like sand, but must be turned into instruments of production, each of which for technical reasons must be of a certain size . . . .[1]

According to Mrs. Robinson, a change in scale only changes efficiency when factors are indivisible. Under conditions of factor divisibility varying returns cannot arise. Let us interpret 'scale', 'factor', and 'indivisibility'.

No great problem is presented by 'scale'. It is generally agreed, I believe, that scale may be measured by the quantity of all factors which are employed in optimal combinations for specified outputs. The aggregate quantity of factors may be arrived at by a sum of factor quantities weighted by the respective prices of the factors.

The interpretation of 'factor' has been more difficult. Frequently it has been so broad as to deprive the term of any meaning. All elements in production including such intangibles as 'organization' and 'methods of production' have been bracketed with 'factors'.[2] Restrictions are required,

[1] Joan Robinson, *The Economics of Imperfect Competition* (London: Macmillan, 1948), p. 334.

[2] For example, F. H. Knight, *Risk, Uncertainty, and Profit* (Boston: Houghton Mifflin, 1921), p. 177.

and there is no reason for departing from those in the usual interpretation: economic goods and services used in production.

The meaning of factor 'indivisibility' also has been the subject of dispute. Sometimes it is taken to refer to the physical discreteness of factor units and the impossibility of distributing their services between firms without incurring some additional costs. Alternatively it is interpreted to comprise all instances where the efficiency of a factor depends on the size of its units. This type of statement is more general than the former and includes it as a special case.

Since indivisibility is interpreted in terms of efficiency, Chamberlin would consider the theory, as stated here, to be tautological. While the argument may be tautological, this is not a necessary consequence of the interpretation. The efficiency referred to in the interpretation of indivisibility is that of a factor and not that of the firm, and the unit to which the conclusion refers is the firm. If factor indivisibility is adduced from differences between measures of the performance of large and small firms, the theory may be tautological. But a factor indivisibility may be adduced from the technology of a process independently of actual performance. Moreover, when data pertaining to actual performance are used, the effect of size of firm may be removed by appropriate statistical methods. Thus the comparison of the efficiency of part-time with that of full-time employees need not be obscured by size of firm. Nor should there be any problem in the measurement of the productivity of large groups of typists each of whom specializes in a particular kind of typing, and that of small groups of unspecialized typists. Any differences in efficiency which are found may be treated as evidence favouring the conclusion that economies of scale are available to large firms in which office work absorbs an important part of total costs. When a factor is found to vary in efficiency according to the size of its units, it may be referred to as indivisible, and the conclusion that economies of scale result from such indivisibilities is valid.

If an indivisibility is not found, however, it is logically incorrect to infer constant returns. Factor indivisibility may not exhaust all the causes of economies of scale. The greater efficiency of a large firm may not be due to particular machines or skills, which are unavailable to small firms, but may come about for other reasons. Thus the use of sampling procedures permits inspection costs to vary less than proportionally with output, since the size of the sample required for a given level of reliability does not vary with that of the population.[1] The number of inspector-hours therefore may vary less than proportionally with output. However, the factor—

[1] T. M. Whitin and M. H. Peston, 'Random Variations, Risk, and Returns to Scale', *Quarterly Journal of Economics*, Nov. 1954, pp. 603–12.

inspectors—is not more efficient in the sense of doing more work per unit of time with a sampling system than without one. All that may be said is that a technical process is available which favours firms with large outputs. An unspecified *ceter*, the nature of the technical process, gives rise to economies of scale even though factors are divisible.

The logically invalid inference of constant returns from the assumption of divisibility is due to the desire of economists to develop a theory which exhausts all causes of varying returns. Thus 'indivisibility' has been considered to include along with known explanations, such as the advantage of specialization, other unspecified explanations of economies of scale. This attempt is exemplified by the quotation from Mrs. Robinson, which was presented above. It is also represented in Knight's statement: 'The fact of limited divisibility is responsible for all differences in the economies of operation of establishments of different sizes.'[1] Failure to recognize that an interpreted theory is unlikely to be exhaustive, thus, is responsible for the fallacious inference.

The effort to render the theory exhaustive also is responsible for the dilution of 'factor'. An attempt has been made to incorporate a *ceteris paribus* premiss in the interpreted theory by including it in the meaning of 'factor'. This device creates the impression that the interpreted theory is exhaustive and therefore 'divisibility' may be taken to imply constant returns.

The consequence has been a meaningless theory. It provides no generalizations concerning sources of varying returns. The imprecision of 'factor' and 'indivisibility' has provided the opportunity for a good deal of speculation concerning their meaning rather than guides to empirical research. The discussion has focused on the hypothetical possibility of splitting humans, of machines which are miniature replicas of larger ones, and of ants as tall as elephants. These efforts are hardly examples of scientific inquiry.

Nevertheless we have a theory of returns to scale. The theory consists of the generalizations pertaining to the advantages of specialization, of certain technological processes such as assembly lines or stamping machines, and the problems of managing large enterprises. Were these Marshallian categories emphasized rather than 'indivisibility' the methodological problems which have been examined here would not have arisen. It would have been clear that the theory was not exhaustive: that other explanations might be found for varying returns. It would have been obvious as well that varying returns could not be deduced from self-evident principles but only became apparent through observation. However, I am not suggesting, as Chamberlin does, that the term 'indivisibility'

[1] loc. cit.

be abandoned. So long as it is understood to be a shorthand reference to known causes of varying returns and not to incorporate all conceivable explanations, its use is unobjectionable.

III. Concluding Remarks

The apparently irresistible inclination to speculate is the source of the disagreements concerning returns to scale. In other areas as well economists have been excessively preoccupied with deductive theory.

Thus, following the presentation of the theory of monopolistic competition, Triffin attacked the concept 'industry'.[1] The lines between industries, it was discovered, were not as sharp as had been supposed. In the light of this new knowledge, Triffin was prepared to abandon the term, and its value has been questioned since in many treatises on price theory. It is absurd, however, to expect a theory, in which the term 'industry' or any other term is used, to fit every case to which it is applied. A theory can be evaluated only after attempts to apply it have been made, and until such time there is no reason either for accepting or rejecting it and the concepts which it embraces.

One of the consequences of Triffin's and others' emphasis on the concept of the industry has been the complaint that census classifications of products are inadequate from the economist's standpoint. It has been suggested that the principle on which classifications should be based is substitutability of products. Only when data are manufactured on this basis would it be possible to develop meaningful measures of concentration and to observe the consequences of various market characteristics. In general, the existence and significance of market power can only be established on the basis of such a classification of industries. However, whether or not significant breaks exist in the chain of substitution is itself part of the question of the presence of market power. The definition of industries in terms of substitutability obscures the issue. To point up this issue it would be helpful to state as a premiss that industries represent collections of substitutable products, and to define industries according to easily observable characteristics which are not themselves the subject of the theory. It would then be clear than any conclusion concerning the presence of market power hinges in part on the degree of substitutability between products.

Another example of unwarranted dependence on pure theory is Chamberlin's fear concerning the validity of the concept of the 'firm'. He suggests that unless 'theory' can demonstrate the inevitability of varying returns to scale, the size of the firm is uncertain, and therefore the firm

[1] Robert Triffin, *Monopolistic Competition and General Equilibrium Theory* (Cambridge, Mass.: Harvard University Press, 1940), *passim*.

itself.[1] But pure theory cannot guarantee or disprove the validity of any concept. The only issue is whether or not it is a useful device for the solution of particular problems, and this depends on the questions themselves and on the data that may be obtained.

The possibility of errors arising out of exclusive dependence on pure theory is demonstrated by the discussion of the role of entry in price determination. According to Machlup, perfect competition requires that the long-run average-cost curve of the firm rise.[2] An increase in price therefore will produce supernormal profits, which will persist unless entry takes place. Machlup concludes that free entry is required for the elimination of supernormal profits.[3]

The crucial assumption in this argument is that the long-run average-cost curve typically is rising in the relevant sector. If, however, the curve is flat over a considerable range, existing firms may be able to accommodate any realistically conceived expansion in demand without incurring higher unit costs. Prices will not increase in the long run and supernormal profits will not persist. Thus with a flat-bottomed long-run average-cost curve free entry is not required for the elimination of supernormal profits.

The usual emphasis on conditions of entry is due to the desire to render the theory determinate. Unless it is assumed that the long-run average-cost curve rises it is impossible to solve for output in the long run. Nevertheless, in fact, the cost curve may not have the required shape, and no evidence has been presented to confirm the assumption. Verification of the assumption would be unnecessary if the prediction itself were confirmed, but it has not been shown that difficult entry tends to be associated with supernormal profits. The insistence on a possibly erroneous prediction originates thus in the formal requirements for an equilibrium solution rather than in any observations.

The development of a theory for prediction requires observations. A primitive theory may be necessary before any empirical work is undertaken, but it cannot be used for prediction. It can indicate only some of the possible inferences from a limited set of assumptions. The high value that has been placed on working out and elaborating the implications of pure theories has interfered with the growth of knowledge in economics.

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[1] Op. cit., p. 230.
[2] Fritz Machlup, *Economics of Sellers' Competition* (Baltimore: Johns Hopkins Press, 1952), p. 28.
[3] Ibid., pp. 280–3.

VALUATION, DEMAND, AND THE 'ANTI-GIFFEN' CASE

By MURRAY C. KEMP

IN his recent book on the theory of demand[1] Professor Hicks has unveiled the mysterious 'anti-Giffen case': (A), '. . . we might get an exception [to the law of demand] in the case of normal goods, if the article in question is sufficiently "strongly normal" '.[2] To this surprising conclusion is added another (B): '. . . we can get no exception to the law of demand in the case of inferior goods'.[3] That Hicks sees no contradiction between his results and established doctrine is indicated by his reference to 'the general looking-glass relation which persists between the two theories'.[4] Whether the reconciliation can be achieved obviously depends on the precise meaning given to 'the law of demand', and on this point the clarity of Hicks's exposition falls short of his general high standard. A reading of chapter ix, section 4 leaves one with the impression that the reference is to the downward slope of the Marshallian demand curve. But in the following section it emerges that not the Marshallian curve but a particular kind of valuation curve is involved. We shall attempt to clarify the relation between these and related concepts, and set out an alternative, geometric reconciliation of the Giffen and anti-Giffen cases.

Imagine a consumer who, subject to the restraint of a given money income m^0 and given values $p_1^0, p_2^0, \ldots, p_n^0$ of prices $P_1, P_2, \ldots, P_n$, is free to purchase any quantities of the n commodities $X_1, X_2, \ldots, X_n$. The quantities purchased are $x_1^0, x_2^0, \ldots, x_n^0$. One commodity, say X_1, is selected for special study. The individual is asked to state the maximum amount v_1^0 that he would be willing to pay for an extra unit of X_1, given freedom to adjust his purchases of $X_2, X_3, \ldots, X_n$ at prices $p_2^0, p_3^0, \ldots, p_n^0$ and assuming that an amount $p_1^0 x_1^0$ is exchanged for the x_1^0 units of X_1. He is then asked to state the maximum amount v_2^0 that he would be willing to pay for the (x_1^0+2)th unit of X_1, on the assumption that all previous units of X_1 are acquired at the price p_1^0. In general he is asked to state the maximum amount v_i^0 that he would be willing to pay for the (x_1^0+i)th unit of X_1, on the assumption that the previous (x_1^0+i-1) units are acquired at the price p_1^0. In this way is generated the *uncompensated marginal valuation curve V^0 corresponding to the price vector* $(p_1^0, p_2^0, \ldots, p_n^0)$. If X_1 is perfectly divisible, V^0 becomes a smooth curve. To each value of P_1, other prices given, there corresponds a separate valuation curve; in Figs. 1 and 2 are drawn two curves, V^0 and

[1] J. R. Hicks, *A Revision of Demand Theory*, Oxford, 1956.
[2] Op. cit., p. 92. [3] Op. cit., p. 92. [4] Op. cit., p. 92.

V^1, which correspond, respectively, to $(p_1^0, p_2^0, \ldots, p_n^0)$ and $(p_1^1, p_2^0, \ldots, p_n^0)$ $(p_1^0 > p_1^1)$. If X_1 is normal, V^1 will lie uniformly above V^0. If X^1 is inferior, the hierarchy is reversed.

The intersection of V^0 and the horizontal line corresponding to p_1^0, defines a point H^0 on the Marshallian demand curve for X_1. (The intersection may be multiple, or may not exist. In the former case, select that inter-

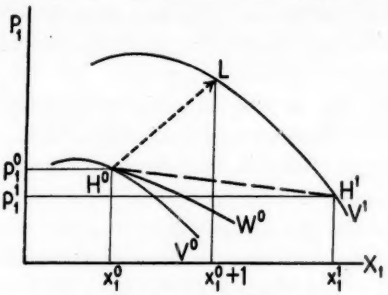

FIG. 1. x_1 Normal

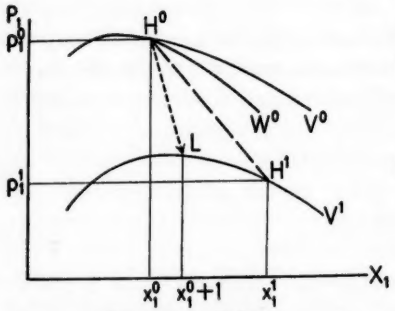

FIG. 2a. x_1 Inferior

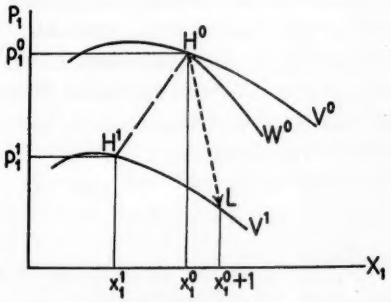

FIG. 2b. x_1 Inferior

section which maximizes the area defined by V^0, the axes and the perpendicular through the point of intersection; at that particular intersection V^0 is downward sloping.) Similarly for the intersection H^1 of V^1 and the horizontal through p_1^1. The set of all such intersections is the *Marshallian demand curve* H^0H^1. It is evident from Figs. 1 and 2 that, if X_1 is normal, H^0H^1 must slope down; and that, if X_1 is inferior, the slope of H^0H^1 may be of either sign. It is the former possibility which constitutes the Giffen case.

Let us now return to statements (A) and (B). Imagine that P_1 falls from p_1^0 to p_1^1 and the amount demanded changes to x_1^1. The uncompensated marginal valuation of the x_1^1th unit is less than that of the x_1^0th unit, both when the latter is computed on the basis of p_1^0 and when it is computed on the basis of p_1^1. But Hicks is interested in quantities intermediate between x_1^0 and x_1^1. If X_1 is normal (Fig. 1), the uncompensated marginal valuation

v_1^1 of (x_1^0+1), computed at p_1^1, may be greater than the uncompensated marginal valuation v_0^0 of x_1^0 computed at p^0. This possibility is dubbed by Hicks the 'anti-Giffen' case; it is illustrated by the upward sloping arrow from H^0 to L (Fig. 1). If, on the other hand, X_1 is inferior (Fig. 2), the arrow *must* slope down. The reconciliation has been effected.

But it is difficult to see what interest can attach to the comparison of v_0^0 and v_1^1, and, therefore, to the anti-Giffen case. The 'arrow curve' H^0L is not a demand curve; and to refer to its downward slope as 'the law of demand' is misleading.

Finally we indicate briefly the relation to the above concepts of the *compensated marginal valuation curve*.[1] Initially x_1^0 is bought at p_1^0 and the marginal valuation is p_1^0. The consumer is now asked to state the maximum amount w_1^0 that he would be willing to give up for an extra unit of X_1 while continuing to pay p_1^0 for the first x_1^0 units. Next he is asked to state the maximum amount w_2^0 he would pay for the (x_1^0+2)th unit on the assumption that p_1^0 is paid for the first x_1^0 units, w_1^0 for the (x_1^0+1)th unit. In general, let w_i^0 represent the maximum amount he would pay for the (x_1^0+i)th unit on the assumption that p_1^0 is paid for the first x_1^0 units, w_1^0 for the (x_1^0+1)th unit, w_2^0 for the (x_1^0+2)th unit, &c. The set of points w_i^0 constitutes the compensated marginal valuation curve W^0 corresponding to the particular money income m^0 and the set of prices $p_1^0, p_2^0, \ldots, p_n^0$. To every price-income situation there corresponds a special compensated marginal valuation curve. If X_1 is normal (Fig. 1), W^0 lies below H^0H^1 and above V^0 to the right of the initial point H^0; if X_1 is inferior (Fig. 2), the relative positions are reversed. W^0 need not be monotonic.[2]

[1] Op. cit., p. 86.

[2] Op. cit., p. 87. In a review article ('Professor Hicks's *Revision of Demand Theory*', *American Economic Review*, xlvii (March 1957), pp. 119–35), Professor Machlup has identified the anti-Giffen case and the upward-sloping stretch of the compensated marginal valuation curve. (See p. 129, n. 10.)

IN DEFENCE OF PUBLIC-UTILITY PRICE THEORY[1]

By M. J. FARRELL

THE purpose of this paper is to defend the principle that a public utility should relate its price to its marginal cost of production against three attacks that have recently been made on it.[2] The principle has been the subject of extensive controversy in the past, but as all the relevant objections are included in the three most recent attacks, it will be convenient to take these as our starting-point and to make no direct reference to the older controversy.[3] A further simplification of the argument is to deal with each of the objections once only, even though it be common to two or more of the attackers.

The importance of this defence is twofold. As a matter of practical economic policy, the adoption of the principle is of the first importance. But, in addition, it may be regarded as an important test case, for the whole class of general principles of economic policy are included, more or less explicitly, in these recent attacks. As it is impossible to give a comprehensive defence of so wide a class of principles against very detailed objections in the space of one short article—it would involve reviewing the greater part of established economic theory—the argument is confined to the public utility rule; but the reader will notice that most of the arguments apply much more generally.

1. Mr. Wiseman and the Wrong Box

Mr. Wiseman's article provides a convenient starting-point, as it enables us to point out at once what we are *not* going to argue about. To borrow Mr. Wiseman's metaphor, we shall not deny that he has found an empty box, but rather assert that he has overlooked a full one. His empty box is the dictum that where a public utility is operating under conditions of decreasing average cost, so that marginal cost is less than average cost,

[1] I am grateful to Dr. M. R. Fisher, Dr. A. R. Prest, and Mr. T. Wilson for their helpful comments, but I am solely responsible for any heresies detected in this article.

[2] See J. Wiseman, 'The Theory of Public Utility Price—An Empty Box', *Oxford Economic Papers*, Feb. 1957; R. G. Lipsey and R. K. Lancaster, 'The General Theory of the Second Best', *Review of Economic Studies*, vol. xxiv, No. 1; J. de V. Graaff, *Theoretical Welfare Economics*, Cambridge, 1957, especially chap. X. Page references to these authors will be to these works.

[3] The interested reader will probably find Nancy Ruggles's survey articles, 'The Welfare Basis of the Marginal Cost Pricing Principle' and 'Recent Development in the Theory of Marginal Cost Pricing', *Review of Economic Studies*, vol. xvii, together with A. M. Henderson's classic 'The Pricing of Public Utility Undertakings', *The Manchester School*, 1947, sufficient; but an abundance of further references can be found both there and in Graaff and Wiseman.

the price charged must equal marginal cost if a welfare optimum is to be attained.

Against this rule he assembles a vast array of arguments, of which the following are the most impressive:

(1) It will usually be only in the short run that average cost exceeds marginal, and in this case the magnitude of marginal cost depends on the (arbitrary) definition of the length of the 'short run'.

(2) A price less than average cost implies a deficit, which has somehow to be covered. The various suggested methods of raising the necessary money—taxation, multi-part tariffs, and price discrimination—are all open to objection.[1]

(3) Criteria of efficient administration are more difficult to apply in an organization that does not attempt to cover its costs.

(4) Since a public utility necessarily raises its capital on gilt-edged terms, its costs will include no element corresponding to the risk-margin of venture capital used in private enterprise, and to this extent marginal cost would represent too low a price.

He might well have added (5) that a welfare optimum requires *all* goods to be priced at marginal cost, so that to the extent that monopolistic conditions or taxation lead to prices above marginal cost in the rest of the economy, the best price under the circumstances for the public utility may be greater than marginal cost. Taken together, these arguments make the rule seem of very doubtful value, and one may even feel that the rule of pricing at average cost—'each tub should stand on its own bottom'—has more to be said for it. But all this assumes that average cost is decreasing, and before one makes sweeping generalizations like Mr. Wiseman's, one must consider the other possibilities.[2]

If marginal and average cost should chance to be equal, then the two rules will give the same answer—although, of course, they may both be

[1] In fact the sheer practical impossibility of making the necessary estimates of each individual's consumer's surplus is decisive in the case of the two latter methods; which is perhaps fortunate, for one would be reluctant to lean very heavily on Mr. Wiseman's theoretical objections. For example, he says on p. 68, 'if all that is required to satisfy the "club" principle is that some consumers should pay rather than go without, then any private discriminating monopolist might meet the conditions'. In the first place, surely the 'club' principle requires also that no-one be asked to subscribe more than the value of his consumer's surplus—a condition that no private monopolist would be likely to respect if it conflicted with his pursuit of maximum profits! But even if a private monopolist were to satisfy the conditions of the 'club' principle, this would hardly invalidate it (although it might create prejudice against it!). After all, many private monopolists are punctual and hard-working. In fact, this is another example of Mr. Wiseman's treatment of necessity and sufficiency, referred to in the last paragraph of this section.

[2] Mr. Wiseman may claim that it is part of his definition of a public utility that it should be subject to increasing returns (see p. 57). This would in any case leave him open to the reproach that he ought to warn his readers that his generalizations are so much less sweeping than they seem; but it is hardly a tenable position in view of his specific reference to the coal industry (p. 56, n. 3).

wrong for reasons (4) and (5). It is, however, also possible that a public utility should be operating under conditions of increasing average cost, so that marginal exceeds average cost, and it is worth while to see how the two rules compare then. The first three objections to the marginal cost rule vanish, for there is no arbitrary exclusion of costs that are not escapable in the 'short run', while spending a surplus involves none of the problems of financing a deficit. Objections (4) and (5) remain—the optimal price may well be above marginal cost—but they hold *a fortiori* against the average cost rule. By contrast, the latter now appears to urge that the whole of the economic rent earned by a public utility be distributed as a subsidy to the consumption of its product. This is arbitrary in the extreme, for, granted that it *might* be desirable to subsidize the product, it would be a remarkable coincidence if the optimal level of the subsidy turned out to be that which would just exhaust the economic rent earned in its production.

Thus, the optimal price is greater than or equal to marginal cost. Where decreasing returns prevail, average cost is less than marginal, so that the latter is always[1] closer than the former to the optimal price. In times of high marginal rates of tax, the possibility of using the economic rent earned by the public utility to improve the allocation of resources elsewhere in the economy by reducing these rates is a positive argument in favour of the marginal rule. Thus the rule that 'a public utility should never set its price below marginal cost' has much to commend it.

In view of some of Mr. Wiseman's arguments, it seems desirable to say a word or two on the relationship between necessary and sufficient conditions.[2] A necessary condition for an optimum must be fulfilled at the optimal point, but may also be fulfilled elsewhere. A sufficient condition can only be satisfied at the optimum, but may not be even there. Clearly, what is ideally wanted is a condition (or set of conditions) that is both necessary and sufficient—that must be satisfied at the optimal point and can be satisfied nowhere else. But this does not mean that a necessary condition that is not sufficient should be ignored. Thus 'price not less than marginal cost' is a necessary but not a sufficient condition for an optimum.[3] It does not tell us what the best price is, but it does tell us that it is not less than marginal cost, so that we can rule out all prices

[1] But see the discussion of section 2 below.

[2] His repeated use of the word 'ambiguous'—apparently to mean 'providing a necessary but not a sufficient condition for an optimum'—seems to be part of an attempt to suggest by means of the emotive overtones of words that necessary conditions which are not sufficient should be ignored. Thus '. . . the welfare criteria give rise to no unambiguous general rule for the price and output policy of public utilities . . .' (p. 72) becomes 'The failure to establish general pricing rules . . .' (p. 73).

[3] So far as the arguments of this section go. This statement, and others in this paragraph, are subject to the qualifications discussed in the remaining sections of the paper.

less than marginal cost as non-optimal. It is thus a valuable piece of information, as is any necessary condition, whether or not it is sufficient. However, the arguments of the present section go farther than this, for they show that a price equal to marginal cost is better than any lower price, which is sufficient to justify the recommendation 'if your price is less than marginal cost, raise it till it equals marginal cost'. It may be desirable to raise it still farther, but the limited increase is bound in itself to be an improvement.

2. The Second Best

It was implicitly assumed in the last section, as indeed it has hitherto been generally assumed, that taxation or monopolistic conditions elsewhere in the economy necessarily imply an optimal price greater than or equal to marginal cost. This assumption is now disputed by Messrs. Lipsey and Lancaster. After a general analysis of the way in which the conditions for a constrained maximum differ from those in the absence of constraint, they give a long and illuminating discussion of the effect on the Pareto conditions of holding the price of one commodity above its marginal cost. Their conclusion is the shattering one that, so far from being able to draw any general conclusions about the effect on optimal prices, it will seldom be possible *even in a particular case* to say whether the optimal price of any other commodity will be greater or less than marginal cost. If this were true, it would certainly invalidate any general pricing rule.

Fortunately, while one is very grateful to them for applying a rigorous analysis to a step that has been regrettably slurred over in the past, their conclusion seems unduly pessimistic. Their paradoxical results are derived by assuming that either the taxed commodity, or the commodity whose optimal price is in question, or both, are close substitutes for money. In other words, they have merely obtained the very reasonable proposition that it is difficult to predict which of two commodities, each a close substitute for the taxed commodity, will have its optimal price raised more. If one makes the reasonable assumption that neither the commodity in question nor the taxed commodity is a close substitute for money, their analysis then shows that for substitutes of the taxed commodity the optimal price is raised, although for complements (if the complementarity is strong enough) it may be lowered. This conclusion accords much more closely with common sense, and offers far less threat to general rules.

It follows that taxation of substitutes for its product will tend to raise a public utility's optimal price above marginal cost, while taxation of complements or subsidizing of substitutes will tend to lower it. It is

valuable to have this qualification set out explicitly but, bearing in mind the rarity of subsidies compared with taxes, and of complements compared with substitutes, it does not seem likely to limit the application of the rule very severely.

3. Redistribution of Income

The question of the optimal distribution of income is raised in all three attacks, and there is an important problem associated with it, but we must be clear as to just what this problem is. The Pareto conditions are necessary but not sufficient: for an optimum one must choose from among all those positions satisfying the Pareto conditions that which has the 'best' distribution of income. This in itself constitutes no objection to the Pareto conditions, nor does the fact that even in principle it is impossible to find taxes and subsidies that will not change supply and demand curves. Any redistribution of income must be accompanied by a change in prices, not in breach of the Pareto conditions, but so as to maintain them.

There is, however, a serious problem connected with the *practical* difficulties of redistributing income. Dr. Graaff points out (p. 78) that it presupposes a system of taxes based not on earnings but on potential earning capacity, and that the consequent problems of assessment are in practice insoluble. Thus it may be that the optimum is not in practice attainable, and that society must be content with some 'second best' solution. In such a solution not all the necessary conditions for an optimum can be fulfilled, and it may be that none is. Thus the Pareto conditions may well not be necessary for the 'second best optimum'—another argument that might seem at first sight to remove the whole justification for the marginal cost rule. Happily, a closer look will reassure us that this is far from being the case.

In the first place, the arguments given in the Appendix give grounds for rejecting Dr. Graaff's assertion 'that tinkering with the price mechanism is one of the more feasible and generally satisfactory ways of securing whatever distribution of wealth is desired' (p. 171). However, not even this is essential to the argument of the present paper, for it will be shown that, even granting, for the sake of argument, the desirability of Dr. Graaff's tinkering, there is still no case for a public utility's charging less than marginal cost.

There are two ways in which the redistribution of income may involve subsidizing a commodity. It may do so directly, as a means of raising those incomes judged to be too low, or indirectly, by applying such taxes and subsidies to other commodities that the conditions for a second best optimum demand a subsidy. But subsidies to the consumption of

commodities are a particularly inefficient way of redistributing income—their justification lies rather in the paternalistic argument that people 'don't know what's good for them'.[1] The best way of making a particular individual better off is to give him an appropriate sum of money. To do so by subsidizing the consumption of one or more commodities involves raising the incomes of all the other consumers of those commodities and raising a correspondingly larger amount of money by taxation (thus violating the Pareto conditions indirectly as well as directly). Nor is the problem of assessment so difficult for subsidies as it is for taxes, for childhood, widowhood, infirmity, sickness, and the like furnish objective criteria of need. Thus, commodity subsidies are unlikely to be involved in optimal methods of income redistribution, so that the only way in which distribution considerations can lead to optimal prices below marginal cost is through the indirect effect of taxation. That is to say, redistribution must involve such a set of taxes that the effect of these on the commodity's complements outweighs that of those on its substitutes.

Redistributive taxes can be roughly divided into those on the earnings of factors of production and those on the consumption of commodities. So far as the latter are concerned, to tax a commodity and then subsidize its close complement is to take away with one hand and give back with the other. The taxation of earnings is a more complex matter. If the commodity is a consumption good, it is necessary that the effect of taxation of factors *via* the prices of its close complements should outweigh the effect *via* the prices of its substitutes—a most unlikely occurrence. If the commodity enters into production, it is necessary that the effect of taxation of those factors that are complementary to it should outweigh that of taxation of its substitutes. This again seems unlikely, although it is possible to conceive rates of tax upon the different factors of production that might produce such a result.

It is thus unlikely that consideration of the distribution of income should lead to an optimal price below marginal cost for any commodity. This is true in particular of public utilities, but it is perhaps worth noting that most public utilities (e.g. fuel, power, transport) sell a large proportion of their product as an intermediate rather than a final commodity. This reinforces the argument against the direct use of subsidies on public utility products to redistribute income, but makes it important to emphasize the possible exception due to the taxation of complementary factors of production. Thus, if capital were subject to much heavier taxation than other factors of production, and were, *over the economy as a whole*, a close complement of fuel, then it might be desirable to subsidize the use

[1] Or, possibly, in the argument that social costs are less than private costs.

of fuel. The latter condition is not very likely to be fulfilled, and it seems particularly unlikely that a very high marginal rate of tax on the earnings of capital would be a good way of redistributing income. Thus, with one possible but unlikely exception, the optimal price for a public utility is unlikely to be less than its marginal cost, even on the assumption that 'tinkering with the price mechanism' is desirable—and tinkering on any but the smallest scale is itself most unlikely to be desirable.

4. Some Further Points

We shall now consider briefly a number of other objections raised by Dr. Graaff to the optimality of the Pareto conditions. Some of the objections are quite trivial, while others, although they involve problems of considerable technical difficulty, are not directly relevant to our present thesis. In the former category comes the point that the Pareto conditions are also necessary for a position of minimum welfare or for a local maximum. This is just another instance of necessary conditions that are not sufficient—but remain necessary.

There is the argument[1] that the Pareto conditions should be abandoned in favour of discriminatory pricing designed to turn the terms of trade in favour of a particular country. But while discriminatory pricing (including as a special case the 'optimum tariff') can be very profitable to a country if it alone practises it, such a state of affairs is not likely to last long. Other countries will retaliate, and in Dr. Graaff's own words, 'the progressive disruption of the allocative efficiency of the world economy as more and more countries resort to protection will [more probably] lead to all being worse off than under free trade'.[2]

The Pareto conditions presume that the efficiency of factors of production is independent of their consumption patterns. There are cases in which this is not true—for instance, under-nourishment or over-indulgence in alcohol may reduce the efficiency of labour, and it may then be desirable to subsidize food or to tax gin. These exceptions may be important, particularly in a very poor country, but they are sufficiently rare and recognizable to be dealt with *ad hoc*.

Then there is the dilemma apparently faced whenever short-run marginal cost exceeds long-run marginal cost.[3] If price is equated to the latter, a position of excess demand will be set up, and the price mechanism will cease to fulfil its short-period allocative function. On the other hand, if price is equated to short-run marginal cost, purchasers will make extensive adjustments, including long-run investments, to a high price

[1] Graaff, p. 146. [2] Graaff, p. 138.

[3] There is, of course, a whole spectrum of 'short-run marginal costs', corresponding to the possible definitions of the short run. It is however convenient to talk as though there were only one.

that is purely temporary. Fortunately, the second norm is a mere stage property, for so long as producers are aware of the temporary nature of the high price, there is no reason to expect them to make more than temporary adjustments to it. Indeed, if they are accurately informed about future price-movements, there is every reason to expect their adjustments to be optimal. Thus, 'marginal cost' must be interpreted to mean the greater of short- and long-run marginal cost.

The Pareto conditions also presume perfect divisibility of all commodities. The full treatment of indivisibilities is a technical problem which cannot be treated here for reasons of space, but we may point out that most indivisibilities can be removed by averaging over time. Thus, it is not a practical proposition to see three-quarters of a play and one-quarter of a film each week; but three plays and one film per month present no difficulties.[1]

External economies of scale are often thought to invalidate the Pareto conditions, but this is a product of confused thinking. It is true that the presence of external economies can prevent a competitive system from attaining the Pareto conditions,[2] but this is a very different matter. Unexploited external economies in an industry mean that it is charging a price greater than marginal social cost for its product, and the effect of this is (as in sections 2 and 3) to raise the optimal price for any other commodity. Thus, unexploited external economies elsewhere in the economy do not affect our rule for the price of a public utility.

Since the public utility is a monopoly, it cannot be subject to the kind of external economies discussed by Adams and Wheeler, i.e. those that are external to the firm but internal to the industry. There are, however, two ways in which it can be subject to external economies. It may, first of all, be faced by a falling supply curve for one or more of its factors of production. If so, this fact should be reflected in its calculation of marginal cost—but this will happen anyway if marginal cost is correctly calculated according to the ordinary definition.

The second possibility is that an increase in the utility's scale of operation will lower the cost curves of firms elsewhere in the economy, other than by making its product available more cheaply. This will only happen if it has some sort of by-product which is socially useful but not marketable. Such a by-product will lead the marginal social cost of expanding the utility to be less than the marginal private cost, and the optimal price must, of course, be based on the former. Here again, a complete treatment of external economies is beyond our present scope, but it is

[1] Graaff makes this point (p. 108) in respect of production goods, but fails to apply his own argument to consumption goods two pages later!

[2] See R. W. Adams and J. T. Wheeler, 'External Economies and the Falling Supply Curve', *Review of Economic Studies*, 1952–3.

not unreasonable to suggest that they should be treated *ad hoc* as particular exceptions to the public utility rule.

There remain the inter-related problems of time-discount and risk-discount, which may be thought of in terms of a two-dimensional array of rates of interest. (It is a useful piece of shorthand to refer to this array as 'the rate of interest'.) One cannot, of course, claim to have reached the welfare optimum unless one uses the optimal rate of interest in computing one's prices, and determining the optimal rate is a very difficult problem. However, in any particular situation a rate will rule in the rest of the economy, and it seems most unlikely that the constrained optimum, taking this *de facto* rate as given, will involve applying a different rate to public utilities.

Each of these last three problems (and particularly that of the rate of interest) deserves a much fuller discussion, which I hope to give elsewhere. I think, however, that I have said enough to suggest that none of them is likely to invalidate our public utility pricing rule.

5. The Practical Importance of the Rule

It was the thesis of the foregoing sections that it is a necessary condition for a welfare optimum that no public utility set its price below marginal cost, and further, that a price equal to marginal cost is better than any lower price. (The latter and stronger proposition is the more useful in practice.) Apart from the problem of economies of scale, the only exceptions to this rule that are at all likely in practice occur when it is desirable to subsidize the utility's product, in order to increase the efficiency of the labour force, or for paternalistic reasons, or because social costs fall short of private costs. In the present section we shall (with these qualifications) take the thesis as established and consider some examples of its practical importance.

It must be emphasized that the exact calculation of marginal cost often involves considerable difficulties, both mathematical and empirical; but that these difficulties are no bar to seeing the magnitude of the possible gains from observance of the rule, nor, indeed, any reason why, in the absence of such exact calculations, the greater part of such gains should not be obtained by using an approximate estimate of marginal cost.[1] It is in principle advisable to use a conservative estimate, for if the present price is too low, any price between it and marginal cost must be better, while some prices in excess of marginal cost may be worse than the original price. Bearing in mind that the optimal price is at least as great as, and on the arguments of Section 1 will usually be greater than marginal cost,

[1] Indeed, the costs of making the exact calculations may be so high that the optimal procedure is to use the approximate estimate.

and that present prices in the cases discussed below are a good deal less than marginal cost, it is clear that only a gross over-estimate of marginal cost could lead to such a situation; but it remains true that it is safer to err on the conservative side.

The point may be illustrated by the case of coal, an apparently very simple commodity which yet has a two-dimensional array of optimal prices, depending on the grade of coal and its geographical location. The former can be handled fairly easily, but the latter involves a very difficult programming problem. This problem has yet to be solved exactly,[1] but nonetheless it can be seen that a great improvement can be obtained by an approximate solution. For it is not difficult to obtain a solution to the locational-variation problem such that deviations from optimal price are of the same order of magnitude as differences in transport costs to a market between pits which might reasonably be expected to serve that market—which are, in Britain, likely to be pretty small differences. On the other hand, the export price of each grade of coal provides a lower limit to its optimal price, and indicates that the present deviation of price from the optimal is considerable. The direct effect of this deviation is the much-publicized shortage of coal, and extravagant use of coal in obsolete equipment by both industrial and domestic consumers; but the distortion produced indirectly may well be even greater, for the economic rent at present being dissipated would be sufficient to produce a considerable reduction in those taxes that fall most heavily at the margin. For example, rough-and-ready calculations[2] suggest that the rent is of the same order of magnitude as the yield of surtax.[3]

A network of roads is obviously a much more complex commodity than coal, and computing the relevant marginal cost is correspondingly more difficult.[4] Again, however, a conservative estimate can be made, and it is of the greatest importance that it should be, for in a road-system that is extensively congested there are the twin dangers, that society will engage in a cripplingly expensive programme of road construction, and that it will suffer great losses from the congestion. It will succumb to either of these dangers (and perhaps to both) through a

[1] For a treatment of a greatly simplified version of the problem see A. Land, 'An Application of Linear Programming to the Transport of Coking Coal', *Journal of the Royal Statistical Society*, Series A, 1957.

[2] See I. M. D. Little, *The Price of Fuel*, p. 29. £150 million is his estimate of the present amount of the rent; he suggests on p. 15 that it will be less in the long run.

[3] Of course the rent need not be applied solely to surtax—there are many other harmful taxes. But, in its highest range, surtax taken together with income tax represents a tax of 1,233 per cent. on the price of factors, whereas income tax alone represents a tax of under 100 per cent. Thus surtax represents by far the highest marginal tax and so is likely to be the most harmful.

[4] For some first steps towards solving this problem, see M. Beckman, C. B. McGuire, and C. B. Winsten, *Studies in the Economics of Transportation*.

failure to make each vehicle bear the marginal social cost of its use of the congested roads. It is perhaps worth saying a word about the ways in which these conservatively estimated charges should be levied. Tolls are, of course, the ideal method in theory, but in practice their collection involves such heavy costs to both state and road-user that they will be the best method only in very exceptional cases. A tax on the fuel used by road vehicles is an easy method in practice of making a charge roughly proportional to road-use in vehicle-miles, but is open to the objection that it does not distinguish between the use of congested and uncongested roads or reflect the differing construction costs of roads used. A tax on parking-space is likely to be a very useful method, for the congestion is worst and the cost of road construction highest in the centres of large towns. In such cases the congestion is often overwhelmingly due to vehicles using central parking-space, so that a tax on parking becomes a convenient way of levying the abnormally high charge appropriate to the use of these central roads. This tax is, of course, over and above charging at marginal cost for the use of the parking-space, i.e. making the charges for street-parking equivalent to those for expensive off-street parking in those areas where the latter has to be provided.

Council housing is another public utility where there is a serious danger of over-investment. It must, of course, be recognized that there is a relatively strong paternalistic argument for subsidizing housing. Paternalistic arguments are generally repugnant to most people—there is a well-founded distaste for the sort of man who tries to make people consume what he feels they ought to like in face of their obvious preference for some other commodity. But this distaste is neither so strong, nor so well-founded, in the case of children's consumption, as this is in any case paternally determined. Thus, while few people would deny a man's right to decide his own optimal consumption of, say, beer and housing, many might question his increasing his own consumption of the former at the expense of his children's consumption of the latter. It may thus be optimal to subsidize the consumption of housing by some or all families; but if so, the size of the subsidy should be determined explicitly, as a value judgement based upon accurate knowledge of the situation. In fact, the pricing principle suggests that, in addition to the overt subsidies by the central and local governments, there is a large concealed subsidy represented by the uncollected economic rent. Indeed, some authorities talk quite openly of 'averaging' the rents of new and older houses, without apparently being aware of the economic implications of this process. This non-optimal price can be regarded either as a simple example of charging average cost in an increasing cost industry, thus dissipating the economic rent, or as a result of a faulty accounting procedure which fails to take

(adequate) account of the appreciation in money value of the older (and especially pre-war) houses. However, accounting methods are a notably intricate field of argument, and the former method has the great advantage of direct analogy with other public utilities. It also gives a clear and simple answer to the question, 'What is the unsubsidized price of a council house?' It is the cost of providing an equivalent marginal house.

These examples, together with electricity, where it would be foolish to try to improve upon Professor Houthakker's classic analysis[1] of the optimal price structure, show that the price policy of public utilities is no academic matter. The observance of the rule would make a considerable contribution to the welfare of the nation, and conversely its violation is costing it dear in terms of unnecessary poverty. The word 'unnecessary' must be stressed, because here for once the economist can genuinely offer something for nothing. There is no need to work harder or to spend less—merely to substitute a rational price structure for an irrational one.

6. The Nature of Rules for Economic Policy

The foregoing discussion can be used to illustrate two fundamental misconceptions of the nature of rules for economic policy—misconceptions which I believe to be responsible for the recent ill-founded attacks not merely on the public utility rule, but on policy rules in general. The first misconception—generally associated with the term 'welfare economics'—is that policy rules should hold with logical certainty. Human psychopathology being what it is, it is in fact impossible to obtain any universally accepted value judgement on which to base one's deductions. But more important is the fact that, if the policy rule is to apply in the real world, it must be based on empirical generalizations—which naturally do not hold with logical certainty. Moreover, since economies are complex, the generalizations will have in practice to be quite broad; and the only game easier than thinking up possible exceptions to broad empirical generalizations is thinking up perverse value judgements! Thus, to set out to derive policy rules with logical certainty is to invite the sort of facile 'de-bunking' that has recently been applied to welfare economics.

> Ah, what a dusty answer gets the soul
> When hot for certainties in this our life!

This is illustrated by our finding, in the case of the public utility rule, that several of the objections consisted merely in 'possible' exceptions which were likely to occur, if at all, only so rarely that they could conveniently be dealt with *ad hoc*. But we also found that some objections, while quite valid in that they suggested reasons why the optimal price

[1] H. S. Houthakker, 'Electricity Tariffs in Theory and Practice', *Economic Journal*, 1951.

should deviate regularly from marginal cost, held *a fortiori* against the currently used rule of setting price equal to average cost. Thus, the marginal cost rule was not optimal, but was a good deal better than its only apparent rival, the average cost rule.

This illustrates the second misconception—that policy rules should be tested against the purely theoretical criterion of whether they give optimal results, and rejected if they do not. On the contrary, they should be tested against the available alternative rules, and the best rule accepted, even if it is clearly a long way from optimality. This is so because decisions must be taken according to some rule, even if, in default of a better, it is the rule that each decision is taken arbitrarily by some arbitrary individual. It is important to emphasize that such attractive-sounding proposals as 'considering each utility individually'[1] or 'making available the positive knowledge on the basis of which laymen can pass judgement'[2] are tantamount to the 'arbitrary decision by default' rule. For the time taken in considering or passing judgement is quite long—ten years up to now in the case of the nationalized industries—and in the meantime prices have perforce been set at some level. This sort of thing would be harmful in a static economy, in a dynamic and rapidly changing one it can be catastrophic.

A set of simple, specific policy rules is, then, essential; and in each case we must choose the best of those available. The adoption of a simple rule does not, of course, mean that one should not consider what deviations from its observance are desirable in particular cases; but this is a very different matter from doing without the rule. A good analogy is provided by the fact that, since clocks and watches are subject to error, it is desirable to check them by astronomical observations; it is not a good idea to dispense with clocks and watches, and take astronomical observations whenever one wants to know the time.

APPENDIX

ALTHOUGH the arguments of this paper would be quite unaffected if Dr. Graaff's assertion 'that tinkering with the price mechanism is one of the more feasible and generally satisfactory ways of securing whatever distribution of wealth is desired' were accepted, one cannot allow such a wild assertion to pass unchallenged. In fact, although it is difficult to argue conclusively about such a broad generalization, all the arguments suggest that it is the direct opposite of the truth.

The arguments that follow assume that to give everyone more of every commodity represents an improvement. This will doubtless seem to the reader, as it does to me, a very mild value judgement with which any normal person would agree. However, it has been suggested[3] that people may be so eaten through with envy that if some people get (in some sense) a smaller rise than others, they will not regard it as an

[1] Wiseman, p. 73. [2] Graaff, p. 170. [3] See Graaff, pp. 51 and 61.

improvement. For my part, I think sufficiently well of my fellow men to believe that such people are extremely rare; but in any case, for an economist to consider them in his prescriptions represents an unwarranted excursion into psychopathology.

Sir Dennis Robertson has put the matter very well:[1] 'How much better, merely to assert as a plain matter of fact that *economic* welfare undoubtedly *will* be increased in this event; and *then* to call in the Archbishop of Canterbury to smack people over the head if they are stupid enough to allow the increased happiness which might be derived from this plain fact to be eroded by the gnawings of the green-eyed monster!'

We may agree with Dr. Graaff that the Pareto conditions and the optimal income distribution are not simultaneously attainable: but it does not follow that the former should be ignored in pursuit of the latter. Indeed, there are reasons for believing that the second best optimum lies much nearer to the opposite extreme, where only such redistributions of income are attempted as do not violate the Pareto conditions. Let us consider this solution, which it will be convenient to call the 'best Pareto' position. It is reached by starting from a position where the Pareto conditions are fulfilled and changing the distribution of income by lump-sum taxes and subsidies until it is the best that is consistent with maintaining the Pareto conditions.[2]

Any further redistribution will involve violating the Pareto conditions through taxation at the margin. This will reduce the national product by diverting factors of production from more to less productive occupations. The extreme case of a less productive occupation is usually thought to be leisure, but leisure is at least desirable in itself. A much more serious loss to the community occurs when the effect of a tax is to divert factors of production into attempts to circumvent it—and this happens, to a greater or lesser extent, with any tax. Smuggling is the classic example, and avoidance of direct taxation the topical one, but the phenomenon is quite general, and indeed extends beyond taxes to all sorts of controls and restrictions. Just as the human body devotes all its strength to healing a wound or fighting an infection, so the economy mobilizes all its resources to overcome any obstacle to its natural working. It is insufficiently appreciated that political interference with the economy contributed to Britain's poor post-war recovery not merely directly through the inefficiency it produced, but also indirectly by drawing off so much of the best entrepreneurial ability into black market operations. But whether the factors are diverted to tax-avoidance, to leisure, or merely to less useful production, the result is the same—a substantial reduction in the national product. Moreover, this reduction will be cumulative if the factors diverted include those (e.g. capital, enterprise, and management) that affect the rate of growth, rather than the level, of production. Thus redistribution carried beyond the best Pareto position will have, even in a static economy, to be bought at the expense of a considerable reduction in the general level of incomes, while in a growing one the price will be the far higher one of a reduction in the rate of growth—and the arithmetic of growth is such that a small difference in rates of growth rapidly produces a large difference in income levels. Moreover, the lower the general level of incomes, the more likely is it, *ceteris paribus*, that people will be preoccupied with redistribution, so that a 'vicious spiral' is likely to appear, excessive redistribution leading to poverty, and poverty to demands for further redistribution. Great Britain affords an instructive example of this process, and may be compared with the United States to show what a greater respect for the Pareto conditions might have produced.[3]

[1] 'Utility and all What?', *Economic Journal*, 1954, p. 677.

[2] Of course, as was pointed out in section 3, the Pareto conditions themselves change as the distribution of income alters.

[3] It must be noted that Britain's greater violation of the Pareto conditions is not limited to redistributive taxes—price controls, rationing, trades union restrictive practices, and many other forms of violation have also been more extensive. Thus the difference in

These arguments suggest that the second best optimum must be near to the best Pareto position, and in an economy where all economic decisions were in the hands of an absolute dictator, it might be proper to engage in nice calculations as to just how near—as to just how much redistribution it was worth buying at the cost of general poverty. But in a state where economic decisions are taken in part politically and in part by collective bargaining, this is hardly true. The cost to an economy of industrial strife on the one hand, and of economic decisions designed to buy votes on the other, may well be immense. Both these sources of loss would be largely eliminated if the exact fulfilment of the Pareto conditions were regarded as above dispute. This suggests that the second best optimum will actually coincide with the best Pareto position, so that the Pareto conditions remain necessary.

income levels measures the cost of violation in general, and not merely of redistributive violation.

It may be argued that part of the difference is due to differences in natural resources. This is true, but a glance at the performance of manufacturing industry in the two countries will show how unimportant it is. In any case, the United States, although nearer than Britain, is still some way from the best Pareto position (witness her heavily subsidized and protected agriculture) so that on balance the difference between the two countries is likely to under-estimate rather than over-estimate Britain's loss through violation of the Pareto conditions.

OXFORD ECONOMIC PAPERS

Volume 9. October 1957. Number 3

CONTENTS

The Rate of Interest and Monetary Policy. By T. WILSON . . 235

The Mind of the City, 1870–1914. By S. G. CHECKLAND . . 261

Demand Theory Revised. By C. F. CARTER 279

The Land Market in the Nineteenth Century. By F. M. L. THOMPSON 285

The Middle-class Co-operative Retailing Societies in London, 1864–1900. By JULIA HOOD and B. S. YAMEY 309

A Note on Economic Development with Subsistence Agriculture. By G. O. GUTMAN 323

Appendix: A Mathematical Note on the Growth of a Two-sector Economy. By J. BLACK 329

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I. *Articles*

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